

**PROJECT SPECIFICATIONS**

**FOR:**

**CAMDEN COUNTY  
RENOVATION AND MODERNIZATION  
REGAN BUILDING  
GENERAL CONTRACTOR**

508 Lakeland Road  
Blackwood, New Jersey 08012

**PREPARED FOR**

**CAMDEN COUNTY**  
520 Market Street  
Camden, New Jersey 08102  
Bid No. A54-20

**PREPARED BY**



304 White Horse Pike, Haddon Heights, NJ 08035  
(856) 546-8611 • Fax (856) 546-8612

**October 19, 2020**

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**Dirk Muits III, AIA, NCARB**  
NJ Registered Architect No. AI 15840  
Bach Project No. CCIA2020-2

## **PROJECT DIRECTORY**

### **OWNER**

Camden County Improvement Authority  
2220 Voorhees Town Center, Voorhees, NJ 08043  
Telephone: (856) 751-2242

### **ARCHITECT**

Bach Associates  
304 White Horse Pike  
Haddon Heights, New Jersey 08035  
Telephone: (856) 546-8611  
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END OF SECTION

**CAMDEN COUNTY DIVISION OF PURCHASING  
COURTHOUSE - 17TH FLOOR  
520 MARKET STREET  
CAMDEN, NEW JERSEY 08102-1375  
(856) 225-5439**

DATE: October 19, 2020

Bid No. and Title: A54-20 Renovation and Modernization | Regan Building – General Contractor

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BIDS MUST BE RETURNED NO LATER THAN 2 pm O'CLOCK, PREVAILING TIME  
ON OCTOBER 29, 2020.

1. PRICES MUST INCLUDE DELIVERIES TO ALL SITES SET FORTH HEREIN.
2. Quotations must be made on these sheets. Camden County is not responsible for any expenses incurred by any firm in preparing or submitting a bid proposal.
3. Prices may be submitted on any or all the items listed unless otherwise specified. Award of contract for goods and services will be made based on the lowest responsible bid on each item or on an aggregate basis, whichever is in the best interest of Camden County and System Members (if this is a Cooperative Pricing bid).
4. Insert NET UNIT PRICES. Bids must be firm for a minimum of 60 days. Contract prices may not be increased during the term of the contract.
5. Camden County and System Members are exempt from sales tax.
6. The County of Camden reserves the right to accept or reject any part or parts of the responses to this bid in accordance with law.
7. To the extent that any of these instructions directly contradict the bid specifications, the bid specifications shall prevail.
8. The County of Camden shall only be responsible for the payment of interest or late fees as provided pursuant to N.J.S.A. 2A:30A-2(c).
9. Official County bid packages for routine goods and services are available from the Camden County Division of Purchasing at no cost to the vendor. (Bids for highway projects are issued by that department for a fee). All addenda are issued by the Division of Purchasing (or Highway department if applicable). **Potential bidders are cautioned that they are bidding at their own risk if a third party supplied the bid specifications.** Such specifications may or may not be complete. The County is not responsible for third party supplied bid specifications.
10. Bidders are required to comply with the requirements of P.L. 1999, c. 238 (N.J.S.A. 34:11-56.25 et seq.) regarding prevailing wages, where applicable.
11. Bidders are hereby noticed that the County shall correct certain types of clerical errors if found in

submitted bids. For example, if the quantity needed or the standard unit of measurement used, times the unit price, is incorrectly calculated in reaching a total or final price, the County will correct the computational mistake.

12. The county requires bidders to list any exceptions to the bid specifications. For any exceptions listed the County shall determine if it will accept an immaterial, or minor, deviation from its bid specifications as permitted by law. Material exceptions shall be cause for rejection of the bid. Bidders shall not be permitted to remove listed exceptions.
13. N.J.S.A. 40A:11-2.1 and 52:32-55 prohibits State and local public contracts with persons or entities engaging in certain investment activities in energy or finance sectors of Iran.
14. Official notification of contract awards authorized by the County may be viewed on camdencounty.com. To review, click on the gold "Your Government" tab, scroll to the information box on the left and click on "County Public Information", then click on "Freeholder Meetings". Meetings and agendas are found here. Click on "Freeholder Meeting (AGENDA)" for the month you would like to view. Copies of resolutions and bid results require an OPRA request. See camdencounty.com for OPRA form and process.
15. Should any requirements or language contained in the contract documents/technical specifications be found to conflict with the County's general bid boilerplate (ITB pages), the requirements/language in the bid boilerplate shall prevail.
16. BIDDERS ARE REQUIRED TO USE THE COUNTY'S FORMS AND SHALL NOT RECREATE IN ANY WAY THE FORMS PROVIDED WITH THIS BID. FAILURE TO USE THE COUNTY FORMS OR ADDING TO, AMENDING, ALTERING, OR REVISING THE COUNTY FORMS, INCLUDING, BUT NOT LIMITED TO, CONVERTING THE COUNTY PDF OR HARDCOPY TO A WORD DOCUMENT, SHALL BE CAUSE FOR REJECTION OF THE BID.

WE SUBMIT HERewith our prices as indicated on the following bid.

Submitted on \_\_\_\_\_, 20\_\_\_\_\_ BY \_\_\_\_\_  
(Name of Company)

Fax No. \_\_\_\_\_ PER \_\_\_\_\_  
(Signature and Title of  
Authorized Representative)

E-Mail: \_\_\_\_\_ Phone No. \_\_\_\_\_



## BIDDER'S CHECKLIST

**THIS BIDDER'S CHECKLIST MUST BE COMPLETED, SIGNED AND SUBMITTED WITH YOUR BID PACKAGE.**

1. Bid Guarantee deposit in the form of a certified check, cashier's check or bid bond. See Paragraph 4.1 and **Exhibit A**. (Must be submitted with bid) \_\_\_\_\_
2. Certificate from a Surety Company or Financial Institution stating that if bid is accepted, they will provide the required performance bond or Letter of Credit. See Paragraphs 4.2, 8.1 and 8.2, and **Exhibits B, C, and D**. (Must be submitted with bid, **must include originals – copies will not be accepted**) \_\_\_\_\_
3. Statement of Corporate Ownership listing the names and **HOME addresses** of all individuals owning ten percent (10%) or more of corporation, partnership or LLC. See **Exhibit E**. (Must be submitted prior to or with bid) \_\_\_\_\_
4. Non-collusion Affidavit properly notarized. See **Exhibit F**. \_\_\_\_\_
5. Affirmative Action Questionnaire with available evidence submitted. See Paragraph 5 and **Exhibit I**. \_\_\_\_\_
6. Affirmative Action MBE/WBE Tracking Form. See Paragraph 5 and **Exhibit J**. \_\_\_\_\_
7. Debarment Certification Form. See **Exhibit K**. \_\_\_\_\_
8. Extension or Non-Extension of Prices to Registered System Members (Other Agencies) See Paragraph 22.1 and **Exhibit L**. \_\_\_\_\_ N/A
9. Textile/Apparel Subcontractor Disclosure Requirements  
  
**For Bids for Textiles and/or Items of Apparel Only.**  
Disclosure of all subcontractors and sites and Certification of Compliance for textile and apparel bids. See Paragraphs 23.1 and Paragraph 23.2 and **Exhibit M**. (Must be submitted with bid). \_\_\_\_\_ N/A

**[BIDDER'S CHECKLIST CONTINUED NEXT PAGE]**

### BIDDER'S CHECKLIST (cont'd)

10. Proof of compliance with The Public Works Contractor Registration Act, if applicable. See Paragraph 24.  
(Must be submitted prior to award of contract). \_\_\_\_\_
11. Construction Subcontractor Disclosure Requirements
  - a. **For Bids for Construction Only.**  
Disclosure of subcontractors as required by N.J.S.A. 40A:11-16. See Paragraph 26 and **Exhibit N**.  
(Must be submitted with bid) \_\_\_\_\_
12. Proof of compliance with the requirements for significant public works projects, where applicable.  
See Paragraph 27 and **Exhibit O**.  
(Must be submitted with bid). \_\_\_\_\_
13. Proof of compliance with the State Contractor Business Registration Program. See Paragraph 31. \_\_\_\_\_
14. Acknowledgement of Receipt of Addenda, whether or not issued, N.J.S.A. 40A:11-23.2. See Paragraph 32 and **Exhibit Q**. (Form must be submitted with bid). \_\_\_\_\_
15. Uniformed Law Enforcement Officer requirement form.  
**Exhibit R**. \_\_\_\_\_ N/A \_\_\_\_\_
16. Certification - Disclosure of Investment Activities in Iran,  
**Exhibit S**. (Form must be submitted with bid). \_\_\_\_\_

\_\_\_\_\_  
**NAME OF BIDDER**

\_\_\_\_\_  
**SIGNATURE**

\_\_\_\_\_  
**DATE**

## **INSTRUCTIONS TO BIDDERS**

### **1. RECEIPT, OPENING, WITHDRAWAL OF BIDS, AND FAILURE TO RESPOND**

- 1.1 Sealed Bids will be received by the County on the date, time, location, and in the manner as listed in the advertisement.
- 1.2 Bids must be received at the Camden County department stipulated in the advertisement no later than the due date and time indicated therein. It is recommended that bids be hand delivered to that department. The County assumes no responsibility for delays in any form of courier or mail order delivery service causing the bid to be received at the **department stipulated** later than the due date and time. All late bids will be rejected in accordance with the law.
- 1.3 Any bid may be withdrawn prior to the time for openings of bids or the authorized postponement thereof. Any bid received after the opening of bids will not be considered. No bidder may withdraw a bid within sixty (60) days after the actual opening thereof.

### **2. QUALIFICATION OF BIDDERS**

- 2.1 The County may make such investigation as it deems necessary to determine the ability of the bidder to perform the work and the bidder shall furnish to the County all such information and data for this purpose as the County may request. The County reserves the right to reject any bids if the evidence submitted by, or investigation of such bidder, fails to satisfy the County that such bidder is properly qualified to carry out the obligations of the contract and to complete the work contemplated herein.

### **3. PREPARATION OF BID**

- 3.1 **Bids must be submitted on the prescribed form. ONE ORIGINAL (1) AND TWO (2) COPIES** of the bid should be submitted. The bidder shall fill in all blank spaces in ink or by typewriter, both in words and figures. Bids must be signed in ink by authorities with capacity to legally bind the bidder to its bid proposal.
- 3.2 Each bid shall be based upon the specifications prepared by the County. The bidder accepts the obligation to become familiar with the County's specifications.
- 3.3 Each bid must give the full business address of the bidder and be signed by an authorized representative. Bids by partnerships must furnish the full name of all partners and must be signed in the partnership name by one of the members of the partnership or by an authorized representative, followed by the signature and designation of the person signing. Bids by corporations must be signed in the legal name of the corporation, followed by the name of the State of Incorporation and must contain the signature and designation of the President, Secretary or other person authorized to bind the corporation in the matter. When requested by the County, satisfactory evidence of the authority of the officer signing on behalf of the corporation shall be furnished.
- 3.4 Bids containing any conditions, omissions, unexplained erasures or alterations, items not called for in the proposal form, attachment or additive information not required by the bid documents, or irregularities of any kind, may be rejected by the County. Any changes, white-outs, strike-outs, etc. on the proposal page must be clear as to meaning and initialed by the person responsible for signing the bid.

- 3.5** The County reserves the right to waive any minor informalities in the bids received as permitted by law or reject bids under certain circumstances as permitted by law.
- 3.6** All bids must be submitted in sealed envelopes bearing on the outside the name of the bidder, address and subject and title of the specifications. If forwarded by mail, the sealed envelope containing the bid must be enclosed in another envelope, addressed as set forth in the advertisement. The County assumes no responsibility for mailings not received on time at the department stipulated in the advertisement to receive bids. It is therefore recommended that bids be hand delivered.
- 3.7** Bidders must insert prices for furnishing all the materials and/or labor required by these specifications whether or not such requirement is specifically set forth. Prices shall be net, including any charges for packing, crating, containers, etc. and all transportation charges fully pre-paid by the contractor F.O.B. destination and placement at locations specified by the County. No additional charges will be allowed for any transportation costs resulting from partial shipments made at the contractor's convenience when single shipment is ordered.
- 3.8** Payments will be made upon the approval of vouchers submitted by the successful bidder in accordance with the requirements of the Board of Chosen Freeholders and subject to the County's customary billing procedures.
- 3.9** The County reserves the right to grant up to three (3) business days' additional time to bidders after the bid opening to provide the following documents required by the bid specifications:
- a. Non-collusion affidavit. See **Exhibit F**;
  - b. Affirmative Action Questionnaire with available evidence submitted. See Paragraph 5 and **Exhibit I**;
  - c. Affirmative Action Plan MBE/WBE Tracking Form. See Paragraph 5 and **Exhibit J**;
  - d. Debarment Certification Form (Certification regarding the Debarment, Suspension, Ineligibility and Voluntary Exclusion - Lower Tier Covered Transactions). See **Exhibit K**.

Such additional time may not in any way affect the price or cost of the bid. All other documents required by the bid specifications must be submitted at the time of the bid opening specified herein or in accordance with law.

#### **4. BID BOND/CONSENT OF SURETY OR LETTER OF CREDIT**

##### **4.1 BID BOND**

Each bid must be accompanied by the Certified Check of the bidder or by a Cashier's Check, or by a Bid Bond prepared on the form of bid bond attached hereto as Exhibit A, duly executed by the bidder as principal, having surety thereon, a surety company approved by the County, in an amount not less than ten percent (10%) of the amount of the base bid submitted, said 10% not to exceed \$20,000.00 pursuant to N.J.S.A. 40A:11-21, payable to the Treasurer, Camden County. Only originals submitted on the County's form Exhibit A will be accepted.

##### **4.2 CONSENT OF SURETY OR LETTER OF CREDIT**

In addition, the bid must also be accompanied by a Certificate (Consent of Surety) from a Surety Company stating that it will provide said bidder with a Performance Bond in the full amount of the bid. County forms are required to be used. A form of Consent of Surety is attached hereto as **Exhibit B.** Only originals submitted on the County's form Exhibit B will be accepted. A form of Performance Bond is attached hereto as **Exhibit C.** **Exhibit C must be signed by the successful bidder and bidder's surety after award of contract and must be returned with the contract.** As an alternative to the consent of surety, bidders may provide a letter from a bank or similar financial institution stating that it will issue a Letter of Credit in the full amount of the bid and pursuant to the terms of the Letter of Credit in the specifications (See **Exhibit D**). **This Letter of Credit option is not available on bids exceeding \$100,000. Such bids require a Consent of Surety/Performance Bond. See N.J.S.A. 40A:11-22.**

- 4.3** Per N.J.S.A. 40A:11-24(a), All bid security, except the security of the three apparent lowest responsible bidders, shall be returned, unless otherwise requested by the bidder, within ten (10) days after the opening of bids, **Sundays and holidays excepted**, and the bids of such bidders shall be considered as withdrawn. Within three (3) days, **Sundays and holidays excepted**, after the awarding and signing of the contract, and the approval of the contractor's performance bond, the bid security of the remaining unsuccessful bidders shall be returned to them.

## **5. AFFIRMATIVE ACTION**

- 5.1** The successful bidder shall adhere to the mandatory affirmative action language required by P.L. 1975, c.127 (N.J.A.C. 17:27) and N.J.S.A. 10:5-31 et seq.
- 5.2** For procurement, professional and service contracts, the above-referenced mandatory language shall be that set forth in **Exhibit G.**
- 5.3** For construction contracts, the above-referenced mandatory language shall be that set forth in **Exhibit H.**
- 5.4** All bidders should complete the Affirmative Action Questionnaire set forth in **Exhibit I** and follow its instructions.
- 5.5** All bidders should complete the Affirmative Action Plan MBE/WBE Tracking Form in **Exhibit J.**

## **6. ADDENDA AND INTERPRETATIONS**

- 6.1** No interpretation of the meaning of any bid document will be made to any bidder orally. Any request for interpretation shall be in writing, addressed to the County's representative stipulated in the bid and must be received at least ten (10) days prior to the date fixed for the opening of bids. All such interpretations and any supplemental instructions will be in the form of written addenda to the specifications and will be distributed to all prospective bidders in accordance with N.J.S.A. 40A:11-23. Failure of any bidder to receive any such addendum or interpretation shall not relieve such bidder from any obligation under his bid as submitted. All addenda so issued shall become part of the contract documents.

## **7. MISCELLANEOUS**

- 7.1** At the time of the opening of bids, each bidder will be presumed to have read and to be thoroughly familiar with the specifications and all other bid documents (including addenda). The failure or omission of any bidder to receive or examine any form, instrument or document shall in no way relieve any bidder from any obligation in respect to his bid.
- 7.2** In case of default by the successful bidder, the County of Camden may procure the articles or services from other sources and hold the successful bidder responsible for any excess cost occasioned thereby.
- 7.3** County of Camden is exempt from any State sales tax and Federal excise tax. In submitting this bid, the bidder certifies that its total bid price does not include any such taxes.
- 7.4** For purposes of evaluation where an equivalent is being furnished, the bidder must indicate any variation to the County's specifications no matter how slight. If no variations are indicated, it will be construed that the bid fully and exactly complies with the County's specifications.
- 7.5** All bids submitted shall include in price any applicable permits, or fees required by any other government entity that has jurisdiction to require the same.
- 7.6** In submitting its bid, the bidder certifies that the merchandise to be furnished will not infringe upon any valid patent or trademark and that the successful bidder shall, at its own expense, defend all actions or suits charging such infringement, and will save the County harmless from any damages resulting from such infringement.
- 7.7** The bidder understands and agrees that, if awarded any contract by the County of Camden, it shall be responsible for insuring that it and all subcontractors meet minimum safety, health and equipment requirements including provisions for protecting employees and the public from any hazards encountered in performing its obligations pursuant to this bid.
- 7.8** All Firms are advised that, pursuant to N.J.S.A. 19:44A-20.27, it is their responsibility to file an annual disclosure statement with the New Jersey Election Law Enforcement Commission ("ELEC") if, during the calendar year, they receive a contract(s) in excess of \$50,000 from public entities, including Camden County. It is the firm's responsibility to determine if such filing is necessary. Additional information on this requirement is available from ELEC at 888-313-3532.

## **8. SECURITY FOR FAITHFUL PERFORMANCE**

- 8.1** Simultaneously with its delivery of the executed contract, the successful bidder shall deliver to the County an executed bond in the amount of one hundred percent (100%) of the accepted bid as security for the faithful performance of this contract and for the payment of all persons performing labor or furnishing materials in connection therewith, prepared in the form of contract bond attached hereto and having a surety thereon such surety company or companies as are acceptable on bonds approved by the County, and as are authorized to transact business in this State.
- 8.2** In the event the successful bidder chooses to supply a Letter of Credit in lieu of the

performance bond required by Section 8.1 above, said Letter of Credit shall be delivered to the County simultaneously with the delivery of the executed contract. The Letter of Credit shall be for the full amount of the bid and shall conform to the terms set forth in the terms of Letter of Credit in these specifications. **This Letter of Credit option is not available on construction projects exceeding \$100,000. Such projects require a Performance Bond. See N.J.S.A. 40A:11-22.**

## **9. INSURANCE REQUIREMENTS**

(Where applicable the following insurance requirements shall apply).

### **9.1 Workers Compensation and Employer's Liability Insurance**

This insurance shall be maintained in force during the life of the contract and shall cover all employees engaged in the performance of the contract. This insurance shall comply with all applicable statutes and regulations. Minimum Employer's Liability insurance of \$500,000.00.

### **9.2 General Liability Insurance**

This insurance shall have limits of not less than \$1,000,000.00 per occurrence and \$3,000,000.00 aggregate for bodily injury and property damage and shall be maintained in force during the life of the contract.

### **9.3 Builders Risk Insurance**

This insurance shall cover all building construction, reconstruction, alteration, or related work and shall have limits of not less than the agreed completed value of the project. The coverage shall be written on a replacement cost basis and a copy of such policy shall be provided to the County before construction commences. Coverage shall remain in force until a certificate of occupancy has been issued.

### **9.4 Automobile Liability Insurance**

This insurance shall cover the Contractor for claims arising from owned, hired and non-owned vehicles and shall have limits of not less than \$1,000,000.00 per occurrence for bodily injury and property damage. Coverage shall be maintained in force during the life of the contract.

### **9.5 Insurance Requirements for Subcontractors**

On any construction, reconstruction, alteration, or similar project, the Contractor shall require each Subcontractor to carry insurance coverage equal to or exceeding the type and level of coverage required to be carried by the Contractor. This coverage shall be in addition to the coverage carried by the Contractor.

### **9.6 Certificates of the Required Insurance**

Certificates for the above listed insurance shall be submitted along with the signed contract as evidence that such insurance is in force and shall name the **County of Camden as additional insured**. The notice to proceed and/or purchase order will not be issued by the County until the certificate of insurance is provided with the signed

contract. Such coverage shall be with acceptable insurance companies operating on an admitted basis in the State of New Jersey.

#### **9.7 Cancellation**

Certificates for the above-listed insurance shall contain a provision that coverage afforded under the policies will not be cancelled without at least thirty (30) days prior written notice to the County of Camden.

### **10. INDEMNIFICATION**

**10.1** The contractor shall assume all risk of and responsibility for, and agrees to indemnify, defend, and save harmless the County of Camden and its officials and employees from and against any and all claims, demands, suits, actions, recoveries, judgments and costs and expenses in connection therewith on account of the loss of life, property or injury or damage to the person, body or property of any person or persons whatsoever, which shall arise from or result directly or indirectly from the work and/or materials supplied under this contract. This indemnification obligation is not limited by but is in addition to the insurance obligations contained in this agreement.

### **11. AWARD**

**11.1** Award of contract will be made by the Camden County Board of Chosen Freeholders within sixty (60) days after the bid opening or within the time allowed by law.

**11.2** Upon award of the contract, appropriate documents shall be forwarded to the successful bidder. N.J.S.A. 40A:11-24(b) requires the contract to be signed by all parties within the time set forth in the specifications, which shall not exceed twenty-one (21) days, Sundays and holidays excepted, after the making of the award. At the expiration of such time, the County may elect to award the bid to the next lowest responsible bidder and accept as liquidated damages the bid security.

### **12. QUANTITIES**

**12.1** Quantities shown are approximate and the Board reserves the right to increase or decrease them to the extent of twenty percent (20%) at the unit price bid. If the number of units in the total is less than ten (10), the County shall have the right to increase or decrease the quantity to not more than ten (10) or less than one at same unit price. Such change, however, will only be upon the written order of the County.

### **13. PREVAILING WAGE ACT / CERTIFIED PAYROLL SUBMISSIONS**

**13.1** Pursuant to N.J.S.A. 34:11-56.25 et seq., P.L. 2009, c.249, and as amended, successful bidders on projects for public work shall adhere to all requirements of the New Jersey Prevailing Wage Act.

**13.2** The contractor on any public works project for the County shall be required to submit a certified payroll record to the County Department administering said public works project. Such certified payroll record must be submitted within ten (10) days of the payment of the wages. The contractor is also responsible for obtaining and submitting all subcontractors' certified payroll records within the aforementioned time period. The contractor shall



submit said certified payrolls in the form set forth in N.J.A.C. 12:60 Appendix A. It will be the contractor's responsibility to obtain any additional copies of the certified payroll form to be submitted by contacting the Office of Administrative Law, CN 049, Trenton, New Jersey 08625 or the New Jersey Department of Labor, Division of Workplace Standards.

**14. METHOD OF AWARD**

- 14.1** For goods and services contracts the County may award the work based on the lowest responsible Base Bid or may elect to award the work based on the line items or unit prices, whichever is in the best interest of the County.
- 14.2** For construction contracts, the County will award the contract to the lowest responsible bidder whose base bid is the lowest.
- 14.3** If Alternates are provided for in the bid and the County determines it has sufficient funds to award some or all of the Alternates, the lowest responsible Base Bid combined with such Alternates as selected will be awarded until a net amount is reached which is within the funds available. Alternate(s) may also be deferred and awarded at a later date in the sole discretion of the County. **The cost of any Alternate(s) included in the bid shall not be combined with the Base Bid for purposes of determining the lowest responsible bidder for award of contract.**

**15. TERM OF CONTRACT**

- 15.1** The term of the contract to be awarded as the result of this bid shall be for one (1) year from the date of execution of the agreement unless otherwise stated.

**16. TERMINATION**

- 16.1** The County may terminate the agreement for any reason upon thirty (30) days written notice to the contractor. The County shall only be responsible for payment up to the effective date of termination.

**17. AMERICAN GOODS AND PRODUCTS TO BE USED WHERE AVAILABLE**

- 17.1** Pursuant to N.J.S.A. 40A:11-18, only manufactured and farm products of the United States wherever available, shall be used in the execution of the work or supply of goods as specified herein.

**18. AVAILABILITY OF FUNDS**

- 18.1** Pursuant to N.J.S.A. 40A:11-15 any contract resulting from this bid shall be subject to the availability and appropriation of sufficient funds annually.

**19. PURCHASING FROM STATE CONTRACT**

- 19.1** The County reserves the right to purchase, during the term of any contract to be awarded, any of the specified materials and/or services through the New Jersey State Cooperative Purchasing Agreement (State Contract) if it is in the County's best interest to do so.

**20. BRAND NAMES AND/OR PRODUCT DESCRIPTION**

- 20.1** Pursuant to N.J.S.A. 40A:11-13, brand names and/or descriptions used in this specification for bid proposal are to acquaint prospective bidders with the type of equipment (or commodity) described 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 the equipment described and material offered are to be fully explained by the bidder in an accompanying letter. In the absence of any changes by the bidder, it will be presumed and required that materials as described in these specifications be delivered.

It is recognized that no two pieces of equipment and no two products are engineered or designed the same. Trade names, brand names and models specified herein are provided to establish a minimum standard of quality acceptable to the County for this bid. Substitute brands, makes and models shall be considered and reviewed based on its ability to perform the specified tasks or provide the same quality of goods as specified in the County's bid. This is known as an "Equivalent".

If the bidder seeks to provide an Equivalent product or good, the bidder shall with its bid, submit specifications or cut sheets for such proposed Equivalent product or good. The County's Architect/Engineer, or specifications writer, for the bid shall review the submission provided by the bidder to determine whether the product or good is an Equivalent to the bid specification. The County's Architect/Engineer or specifications writer shall have the final decision on whether a bidder's submitted product specifications are an Equivalent to the named product(s) or good(s) in the bid.

## **21. WORKER AND COMMUNITY RIGHT TO KNOW**

- 21.1** The successful bidder shall comply with all provisions of the Worker and Community Right to Know Act, N.J.S.A. 34:5A-1 et seq., as well as the regulations under the Act (N.J.A.C. 8:59-1.1 et seq.).

## **22. COOPERATIVE PRICING**

- 22.1** If this bid is being issued under the **Camden County Cooperative Pricing System, System Identifier No. 57-CCCPS**, then each bidder must read the **Rules and Instructions for Bids Under the Camden County Cooperative Pricing System** attached hereto and indicate on **Exhibit L** whether its bid proposal is extended or not extended to registered system members (other agencies) by checking the appropriate box.

**IMPORTANT NOTICE: A bidder's failure to complete Exhibit L in the case of a bid for the Camden County Cooperative Pricing System shall be deemed to be an extension of prices by that bidder to registered system members (other agencies).**

## **23. BIDS FOR THE PURCHASE OF TEXTILES AND ITEMS OF APPAREL**

In accordance with Resolution No. 55 of the Camden County Board of Chosen Freeholders adopted on May 21, 1998, the following terms and conditions shall apply to all bids for the purchase of textiles and/or items of apparel:

- 23.1 Disclosure of all subcontractors and sites**

Each bidder shall set forth in **Exhibit M** of its bid response the name and address of each subcontractor to be used in the provision of the goods or services which are the subject of this bid. Additionally, each bidder shall set forth in **Exhibit M** of its bid the name and address of all locations, including subcontractor locations, substantially involved in the production of the goods or services which are the subject of this bid. Such information shall be considered public information.

### **23.2 Certification of Compliance.**

Bidders shall certify in **Exhibit M** that each location, including subcontractor locations, substantially involved in producing or distributing such goods meet the following standards:

**a. Compensation.** Wage and benefit levels must be sufficient to meet basic needs and provide some discretionary income for a family of 4 (a "living wage"). For employment within the United States, this shall mean wages of at least \$7 per hour in 1997 dollars, along with affordable family health benefits and company-paid pension benefits typical of responsible employers.

**b. Rights.** The company respects workers' rights to speak up about working conditions without fear of retaliation, and to form unions of their own choosing without employer resistance. Due process and just cause procedures are used for discipline or discharge. The company complies with all laws, regulations, and ILO standards governing the workplace. The company does not use child labor, forced labor, or corporal punishment. The company does not discriminate in hiring, promotion or compensation based on race, national origin, religion, gender, sexual preference, union affiliation, or political affiliation.

**c. Safety and Health.** The company provides a safe and healthy work environment.

### **23.3 Correction and remediation of violations; Proof of compliance**

The County may, at its discretion, require correction and remediation of violations of the standards listed above prior to renewing commerce with the contractor. The County may require further proof of compliance with the aforementioned standards. Upon the County's request, the contractor or subcontractor shall make all relevant records available to the County or its designee.

## **24. COMPLIANCE WITH PUBLIC WORKS CONTRACTOR REGISTRATION ACT**

The bidder shall comply with The Public Works Contractor Registration Act, P.L. 1999, c. 238 on all bids for public works as defined in the law. Proof of compliance with this law, when applicable, must be submitted prior to award of contract. The bidder and its named specialty trade sub-contractor(s) listed in Exhibit N (see below), shall provide proof of compliance prior to award of contract or bid will be rejected as non-compliant. Questions regarding this law may be directed to the New Jersey Department of Labor and Workforce Development, Contractor Registration Unit at 609-292-9464.

**The County strongly recommends that each bidder provide its public works contractor registration certificate (and certificates for each Exhibit N subcontractor) with submission of bids.**

## **25. REQUEST FOR TAXPAYER IDENTIFICATION NUMBER AND CERTIFICATION**

Upon execution of the contract with the County, the successful bidder shall be required to complete and

submit IRS Form W-9, Request For Taxpayer Identification Number And Certification to the County's Division of Accounts Payable, 520 Market Street, 10th Floor, Camden, New Jersey 08102. This requirement shall only apply to the successful bidder. Failure by the successful bidder to meet this requirement shall result in the County withholding such funds as required by IRS regulations.

## **26. BIDS FOR CONSTRUCTION/DISCLOSURE OF SUBCONTRACTORS**

### **26.1 Definition of Construction Bid.**

"Construction" means construction, alteration or repair of any public building when the entire cost of the work will exceed the bid threshold. In addition to construction bids, the County specifically requires that bidders identify all subcontractors in specialty trade categories for all bids where such specialty trades may be required (see below and Section 35).

### **26.2 Disclosure of Subcontractors.**

**a.** Bidders must list in **Exhibit N**, all subcontractors that they intend to use in the specialty trade categories of: Plumbing and Gas Fitting, and All Kindred Work; Steam Power Plants, Steam and Hot Water Heating and Ventilating Apparatus, and All Kindred Work; Electrical Work; and Structural Steel and Ornamental Iron Work, as required to be listed by N.J.S.A. 40A:11-16. **FAILURE TO LIST THESE REQUIRED SUBCONTRACTORS SHALL BE CAUSE FOR REJECTION OF BID.** Bidders with questions regarding this process should consult their counsel.

**b.** Substitution of subcontractors shall be permitted only in cases of impossibility, e.g., the death of the subcontractor or where the subcontractor goes out of business.

**c.** The bidder's proposal will be rejected if the subcontractors listed do not comply with the requirements for the designated work tasks.

**d.** A general contractor that intends to utilize a specific subcontractor to perform work in one or more of the above-referenced specialty trade categories set forth in N.J.S.A. 40A:11-16 (See **Exhibit N**), shall provide the required information about that subcontractor in the appropriate spaces for each specialty trade category applicable to the contract.

A general contractor that intends to perform work in one or more of the above-referenced specialty trade categories set forth in N.J.S.A. 40A:11-16 (See **Exhibit N**) through the use of its own employees or the general contractor himself rather than through utilization of a subcontractor shall write the word "In-House" next to each applicable category and then insert the name, and the license number where required, of each such employee of the general contractor or the general contractor himself in the appropriate spaces for each specialty trade category applicable to the contract.

If the contract does not involve any of the above-referenced specialty trade categories set forth in N.J.S.A. 40A:11-16, the contractor shall insert the word "None" in each appropriate space provided.

**e.** If the bidder proposes to perform **plumbing, gas fitting and all kindred work** with its own personnel, it shall follow the requirements of N.J.S.A. 45:14C-1 et seq. and N.J.A.C. 13:32-1.1 et seq.

f. If the bidder proposes to perform **electrical work** with its own personnel, it shall follow the requirements of N.J.S.A. 45:5A-1 et seq. and N.J.A.C. 13:31-1.1 et seq.

## **27. SIGNIFICANT PUBLIC WORKS PROJECTS**

By Resolution No. 71 adopted June 17, 2004, the Board of Chosen Freeholders of the County of Camden (Board) set the following bid specification requirements for significant County public works projects:

- a. "Significant Public Works Project" means construction, reconstruction, demolition, alteration, or repair work, or maintenance work, including painting and decorating, done under contract and paid for in whole or in part out of Camden County funds which equal or exceed the sum of \$25,000.00, which sum shall be adjusted in accordance with the bid threshold provision of N.J.S.A. 40A:11-3 as amended from time to time.
- b. All bids on significant public works projects shall include an apprenticeship program in the appropriate trade(s), registered in the State of New Jersey, with the United States Department of Labor, Bureau of Apprenticeship and Training or contain a statement of agreement not to employ any worker of less than journeyman status on the project; and
- c. A detailed statement of compliance shall be completed by the bidder and the specialty trade subcontractors set forth in Paragraph 26 above and identified in Exhibit N and submitted as a material requirement of the bid for the bid to be accepted. This statement shall be made in **Exhibit O**. Additionally, the successful bidder must submit a detailed statement of compliance as set forth in **Exhibit O** for **all other subcontractors** prior to the commencement of work by said subcontractors.
- d. The County of Camden may refuse to award a contract to a person or entity submitting a bid or proposal if that person or entity has filed or submitted false information or failed to file or submit the information required by Resolution No. 71 adopted by the Board on June 17, 2004. The County may require further proof of compliance with the standards set forth above. Upon request, the contractor shall make all relevant records available to the County or its designee.

## **28. NO DAMAGES FOR DELAY**

Extension of the contract time shall be the sole remedy of the Contractor for any: (1) delay in the commencement, prosecution or completion of the work; (2) hindrance or obstruction in the performance of the work; (3) loss of productivity; or (4) other similar claims whether or not such delays are foreseeable, unless such delay is due to the County's negligence, bad faith, active interference, tortious conduct or other reasons unanticipated by the parties that delay the contractor's performance, in accordance with the provisions of N.J.S.A. 40A:11-16.7. The aforementioned shall apply to any contract awarded as the result of this bid including but not limited to contracts for construction, goods, or services.

## **29. ALTERNATIVE DISPUTE RESOLUTION**

For construction contracts, as defined in N.J.S.A. 40A:11-50, disputes arising under the contract

shall be submitted to mediation or non-binding arbitration pursuant to industry standards prior to being submitted to a court for adjudication.

### **30. COMPLIANCE WITH THE AMERICANS WITH DISABILITIES ACT**

The successful bidder shall comply with the mandatory language of the Americans With Disabilities Act as set forth in **Exhibit P** attached hereto.

### **31. COMPLIANCE WITH CONTRACTOR BUSINESS REGISTRATION PROGRAM**

Pursuant to N.J.S.A. 52:32-44, Camden County is prohibited from entering into a contract with an entity unless the bidder/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 the Treasury.

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

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

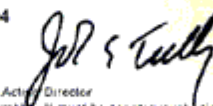
During the course of contract performance:

- (1) The contractor shall not enter into a contract with a subcontractor unless the subcontractor first provides the contractor with a valid proof of business registration.
- (2) The contractor shall maintain and submit to the Contracting Agency a list of subcontractors and their addresses that may be updated from time to time.
- (3) The contractor and any subcontractor providing goods or performing services under the contract, and each of their affiliates, shall collect and remit to the Director of the Division of Taxation in the Department of Treasury, the use tax due pursuant to the Sales and Use Tax Act, (N.J.S.A. 54:32B-1 et seq.) on all sales of tangible personal property delivered in the State. Any questions in this regard can be directed to the Division of Taxation at (609) 292-6400. Form NJ-REG can be filed online at [www.state.nj.us/treasury/revenue/busregcert.shtml](http://www.state.nj.us/treasury/revenue/busregcert.shtml).

Before final payment is made under the contract, the contractor shall submit to the Contracting Agency a complete and accurate list of all subcontractors used and their addresses.

Pursuant to N.J.S.A. 54:49-4.1, a business organization that fails to provide a copy of a business registration as required, or that provides false business registration information, shall be liable for a penalty of \$25 for each day of violation, not to exceed \$50,000, for each proof of business registration not properly provided under a contract with a contracting agency.

**The County strongly recommends that each bidder provide its BRC (and BRC's for each subcontractor) with submission of bids.**

STATE OF NEW JERSEY BUSINESS REGISTRATION CERTIFICATE FOR STATE AGENCY AND CASINO SERVICE CONTRACTORS		DEPARTMENT OF TREASURY DIVISION OF REVENUE PO BOX 252 TRENTON, N.J. 08646-0252
TAXPAYER NAME: <b>TAX REGISTRATION TEST ACCOUNT</b>	TRADE NAME: <b>CLIENT REGISTRATION</b>	
TAXPAYER IDENTIFICATION#: <b>970-097-382/500</b>	SEQUENCE NUMBER: <b>0107330</b>	
ADDRESS: <b>847 ROEBLING AVE TRENTON NJ 08611</b>	ISSUANCE DATE: <b>07/14/04</b>	
EFFECTIVE DATE: <b>01/01/01</b>		
FORM-BRC(08-01)	 Acting Director	
This Certificate is NOT assignable or transferable. It must be conspicuously displayed at above address.		

STATE OF NEW JERSEY BUSINESS REGISTRATION CERTIFICATE	
Taxpayer Name:	TAX REG TEST ACCOUNT
Trade Name:	
Address:	847 ROEBLING AVE TRENTON, NJ 08611
Certificate Number:	1093907
Date of Issuance:	October 14, 2004
For Office Use Only:	
20041014112823533	

### 32. ACKNOWLEDGEMENT OF RECEIPT OF ADDENDA

The bidder shall complete, sign and return with bid **Exhibit Q** attached hereto. Form must be completed and returned with bid regardless of whether addenda were issued by the County.

### 33. UNIFORMED LAW ENFORCEMENT OFFICERS REQUIREMENT FORM

Pursuant to N.J.S.A. 40A:11-23.1(c) if uniformed law enforcement officers are required for the project, **Exhibit R** will be completed by the County and indicate a good faith estimate of the total cost of traffic control personnel, vehicles, equipment, administrative, or any other costs associated with additional traffic control requirements as determined by the County with input from any other public entity affected by the project. These estimated amounts reflect those costs above and beyond the bidder's traffic control costs.

### 34. APPROVAL AND CERTIFICATION OF BILLING

Authorization for payment of periodic billing, final payments or retainage monies requires approval and certification by formal resolution of the Camden County Board of Chosen

Freeholders. Pursuant to P.L. 2006, c. 96, all billing amounts due under a contract with the successful bidder and all required purchasing documents must be received at least ten (10) days in advance of the next scheduled public meeting of Board of Freeholders for the month in which payment is requested. Approved and certified amounts due will be paid during the County's subsequent payment cycle.

**35. PROPRIETARY GOODS**

\_\_\_\_\_ **County to Check if applicable**

If checked off above, the goods set forth in the technical specifications have been certified as proprietary goods in accordance with the Local Public Contracts Law, N.J.S.A. 40A:11-1 et seq. No substitutions or equivalents will be accepted. Please see the technical specifications attached hereto.

**36. CONTRACTS WHERE ASPHALT WORK IS INCLUDED IN SPECIFICATIONS**

P.L. 2015, c.201 requires the inclusion of a pay item for an asphalt price adjustment for any bid specification that includes the purchase or use of hot mix asphalt; provides for application of a fuel price adjustment where a pay item is eligible (see NJDOT Section 160.03.01, where applicable); for contracts issued for more than 1,000 tons, requires the price adjustment pay item be applied to each ton of hot mix asphalt purchased and used, not just the tonnage exceeding the 1,000 ton threshold; clarifies that the term "hot mix asphalt" includes equivalent asphalt cement-based products (e.g. warm mix asphalt); prohibits disaggregation of quantities to avoid compliance with P.L. 2015, c.201.

- 37.** Pursuant to N.J.S.A. 40A:11-16.6, all construction contracts issued by the County when the total price of the originally awarded contract equals or exceeds \$5,000,000.00, shall allow for value engineering construction change orders to be approved after the award of the contract.

**38. PERMISSION FOR BIDDER TO WITHDRAW A PUBLIC WORKS BID DUE TO A MISTAKE IN CERTAIN CIRCUMSTANCES**

Effective March 4, 2011, N.J.S.A. 40A:11-23.3 authorizes a bidder to request withdrawal of a **public works bid** due to a mistake on the part of the bidder. A mistake is defined by N.J.S.A. 40A:11-2(42) as a clerical error that is an **unintentional and substantial computational error or an unintentional omission of a substantial quantity of labor, material, or both, from the final bid computation.**

A bidder claiming a mistake under N.J.S.A. 40A:11-23.3 must submit a request for withdrawal, **in writing**, by certified or registered mail to the Camden County Purchasing Agent, 520 Market Street, 17<sup>th</sup> Floor, Camden, New Jersey, 08102. Written requests must be provided within five business days after the receipt and opening of the bids. The bid withdrawal shall be effective as of the postmark of the certified or registered mailing.

A bidder's request to withdraw the bid shall contain evidence, including any pertinent documents, demonstrating that a mistake was made. Such documents and relevant written information **shall** be reviewed and evaluated by the public owner's designated staff pursuant to the statutory criteria of N.J.S.A. 40A:11-23.3.

The County will not consider any written request for a bid withdrawal for a mistake as defined by N.J.S.A. 40A:11-2(42), by a bidder in the preparation of a bid proposal unless the postmark of the certified or registered mailing is within five business days following the opening of bids.



If a bidder is granted a bid withdrawal, the bidder shall be disqualified from future bidding on the same project, including whenever all bids are rejected pursuant to N.J.S.A. 40A:11-13.2

**39. N.J.A.C. § 17:44-2.2 AUTHORITY TO AUDIT OR REVIEW CONTRACT RECORDS**

(a) Relevant records of private vendors or other persons entering in to contracts with covered entities are subject to audit or review by OSC pursuant to N.J.S.A. 52:15C-14(d).

(b) As of November 15, 2010, all covered entities shall insert the following language in any new contract:

"(The contract partner) 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."

**40. NEW JERSEY ANTI-DISCRIMINATION PROVISIONS: N.J.S.A. 10:2-1 et seq.**

If awarded a contract, the contractor agrees to abide by the New Jersey anti-discrimination provisions contained in N.J.S.A. 10:2-1 et seq. See Exhibit T.

**END OF INSTRUCTIONS TO BIDDERS / EXHIBITS BEGIN ON NEXT PAGE**

**EXHIBIT A**  
**SAMPLE FORM OF BID BOND**

A. We, the undersigned

\_\_\_\_\_ as Principal and  
\_\_\_\_\_ as Surety, are hereby held and firmly bound unto  
\_\_\_\_\_ in the penal sum of \_\_\_\_\_ Dollars

(\$\_\_\_\_\_), lawful money of the United States for the payment of which well and truly to be made, we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors and assigns. Signed this \_\_\_\_\_ day of \_\_\_\_\_, 20 \_\_\_\_\_.

B. THE CONDITION of the above obligation is such that whereas the Principal has submitted to the \_\_\_\_\_,  
a certain bid attached hereto and hereby made a part of hereto and hereby made a part of hereof, to enter in to a contract in writing for the (insert type of work)  
\_\_\_\_\_.

C. **NOW THEREFORE:**

If said bid shall be rejected, or in the alternate, if said bid shall be accepted and the Principal shall execute and deliver a contract in the form of Agreement required by the Bid Documents and for the payment of all persons performing labor or furnishing materials in connection therewith, and shall in all respects perform the agreement created by the acceptance of said bid. Then this obligation shall be void, otherwise the same shall remain in force and effect, it being expressly understood and agreed that the liability of the surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

D. THE SURETY for value received, hereby stipulates and agrees that the obligations of said Surety and its bond shall in no way be impaired or affected by an extension of the time within the "OBLIGEE" may accept such bid. And said Surety does hereby waive notice of any such extension.

E. IN WITNESS, WHEREOF, the Principal and the Surety have hereunto set their hands and seals, and such of them as corporations have caused their corporate seals to be hereto fixed and these presents to be signed by their proper officers, the day and year set forth above.

\_\_\_\_\_(L.S.)  
PRINCIPAL

\_\_\_\_\_  
SURETY

(SEAL)

\_\_\_\_\_  
BY

**NOTE:** Bid Bond must be signed by an authorized agent or representative of a surety company and not by the individual or company submitting the bid.

**EXHIBIT B**

**SAMPLE FORM OF CONSENT OF SURETY**

BOND NO. \_\_\_\_\_  
(INSERT YOUR BOND NO. HERE)

The \_\_\_\_\_, a Corporation organized and  
(NAME OF YOUR INSURANCE COMPANY)

existing under the laws of the State of \_\_\_\_\_,

and licensed to do business in the State of New Jersey, hereby consents and agrees that if the

contract for: \_\_\_\_\_ (INSERT BID NO.)

\_\_\_\_\_ AND ITEMS  
WHICH YOU ARE BIDDING).

be awarded to \_\_\_\_\_.  
(NAME OF YOUR COMPANY)

the undersigned Corporation agrees with the said County of Camden, Courthouse, 520 Market Street, Camden, New Jersey 08102 to execute the final bond as required by the specifications and to become the surety in the full amount of the price bid for the faithful performance of the contract.

In Witness, Whereof, the undersigned Corporation has caused this agreement to be signed by its duly authorized representative and its Corporate Seal to be hereto affixed this \_\_\_\_\_ day of \_\_\_\_\_, 20 \_\_\_\_.

The \_\_\_\_\_  
(NAME OF INSURANCE COMPANY)

By \_\_\_\_\_  
(ATTORNEY-IN-FACT)

Countersigned by:

**NOTE:**      **Consent of Surety must be signed by an authorized agent or representative of a surety company and not by the individual or company submitting the bid.**

**EXHIBIT C**

**SAMPLE FORM OF PERFORMANCE BOND**

We, the Undersigned

\_\_\_\_\_

as Principal, and \_\_\_\_\_

\_\_\_\_\_

a Corporation organized and existing under the laws of the State of \_\_\_\_\_ and authorized to do business in the State of New Jersey as surety are held and firmly bound unto \_\_\_\_\_ hereinafter called the Owner as hereinafter set forth, in the full and just several sums of

(a) \_\_\_\_\_

\_\_\_\_\_ Dollars (\$) \_\_\_\_\_)

for faithful performance of the contract as hereinafter designated in Paragraph "A" and

(b) \_\_\_\_\_

\_\_\_\_\_ Dollars (\$) \_\_\_\_\_)

for payment of labor and material as hereinafter designated in Paragraph "B" and

(c) \_\_\_\_\_

\_\_\_\_\_ Dollars (\$) \_\_\_\_\_)

for maintenance as hereinafter designated in Paragraph "C"; lawful money of the United States of America; to be paid to the Owner, or its Assigns, to which payment well and truly to be made and done, we bind ourselves, our heirs, executors, administrators and successors, jointly and severally, firmly by these presents.

Sealed with our respective seals and dated this \_\_\_\_\_ day of \_\_\_\_\_, 20 \_\_\_\_\_.

WHEREAS, the above bonded Principal has entered into a contract with the Owner dated the \_\_\_\_\_ day of \_\_\_\_\_, 20 \_\_\_\_\_ for \_\_\_\_\_

\_\_\_\_\_

upon certain terms and conditions in said contract more particularly mentioned; and

WHEREAS, it is one of the conditions of the award of the Owner pursuant to which said contract is about to be entered into, that these presents be executed.

**(Sample Form of Performance Bond – continued)**

**NOW, THEREFORE, THE CONDITIONS OF THIS OBLIGATION ARE SUCH:**

**A.** That if the Principal shall faithfully perform the contract on its part to be performed according to the terms of said contract, or any changes or modifications therein made as therein provided; and shall indemnify and save harmless the party of the first part mentioned in the contract aforesaid, its officers, agents and servants, and each and every one of them against and from all suits and costs of every kind and description and from all damages which the said party of the first part in said contract mentioned, or any of its officers, agents or servants may be put by reason of injury to the person or property of others resulting from the performance of said work or through the negligence of the said party of the second part to said contract, or through any improper or defective machinery, implements or appliances used by the said party of the second part in the aforesaid work or through any act or omission on the part of the said party of the second part or its agents, servants or employees, and shall further indemnify and save harmless the party of the first part mentioned in the contract aforesaid its officers, agents and servants from all suits and actions of any kind or character whatsoever, which may be brought or instituted by any subcontractor, materialman or laborer who has performed work or furnished materials in or about the work required to be done pursuant to the said contract or by or on account of, any claims or amount recovered for any infringement of patent, trademark, or copyright; then this part of this obligation designated as part "A" shall be void; otherwise the same shall remain in full force and effect, it being expressly understood and agreed that the liability of the surety for any and all claims hereunder shall in no event exceed the penal amount of this obligation as herein stated.

**B.** That if the said Principal shall pay all lawful claims of subcontractors, materialmen, laborers, persons, firms or corporations for labor performed or materials, provisions, provender or other supplies or items, fuels, oils, implements or machinery furnished, used or consumed in the carrying forward, performing or completing of said contract; we agreeing and assenting that this undertaking shall be for the benefit of any subcontractor, materialman, laborer, person, firm or corporation having a just claim, as well as for the obligee herein; whether or not the said material and labor enter into and become component parts of the work or improvement or in any amendment, extension or addition to said contract, then this part of this obligation designated part "B", shall be void, otherwise the same shall remain in full force and effect.

**C.** That if the said Principal shall well and truly keep and perform all the obligations, agreements, terms, and conditions of such contract, on the Principal's part to be kept and performed and said Principal shall be responsible for poor workmanship done or poor materials furnished under said contract for a period of one year from the date of the completion and final acceptance by the party of the first part and mentioned in the contract, and said Principal shall pay for all labor performed and furnished and for all materials used in correcting any poor workmanship done and replacing any poor materials furnished, then this part of this obligation designated part "C", shall be void; otherwise the same shall remain in full force and effect.

It is further agreed that any alterations which may be made in the terms of the contract or in the work to be done or materials to be furnished or labor to be supplied or performed under it or the giving by the Owner of any extension of time for the performance of the Contract or the reduction of the retained percentages as permitted by the Contract or any other forbearance on the part of either the Owner or the Principal to the other, shall not in any way release the Principal and the

**(Sample Form of Performance Bond – continued)**

Surety or Sureties or either or any of them, their heirs, executors, administrators, successors or assigns, from their liability hereunder, notice to the Surety or Sureties of any alterations, extension or forbearance being hereby waived.

It is further agreed that in case of default in, and/or any action arising out of rights and liabilities secured by this obligation or any part hereto or any person claiming by or through it, either may use for the purpose of establishing its, or their claim, a copy of this obligation certified by the Owner, and the action, or actions, if any, arising on the within bond, shall not be a bar to any subsequent action that may arise through any liability incurred in any other action herein, and based upon any other part of this obligation.

IN WITNESS, WHEREOF, the said Principal and Surety have duly executed this bond under their seals the day and year above written.

If Principal is an individual:

Witness:

\_\_\_\_\_

By \_\_\_\_\_(SEAL)

\_\_\_\_\_  
Surety

\_\_\_\_\_

By \_\_\_\_\_  
Attorney-in-fact  
(Corporate Seal)

If Principal is a partnership:

Witness:

\_\_\_\_\_

\_\_\_\_\_  
Principal

\_\_\_\_\_(SEAL)  
Partner

\_\_\_\_\_

\_\_\_\_\_(SEAL)  
Partner

\_\_\_\_\_  
Surety

By \_\_\_\_\_  
Attorney-in-fact  
(Corporate Seal)

**(Sample Form of Performance Bond – continued)**

If Principal is a corporation:

Attest:

\_\_\_\_\_  
Secretary

\_\_\_\_\_  
Principal

By \_\_\_\_\_  
President

Corporate Seal:

Attest:

\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
By \_\_\_\_\_  
Attorney-in-fact  
(Corporate Seal)

Approved as to Form \_\_\_\_\_, 20\_\_\_\_

\_\_\_\_\_  
Assistant County Counsel

**EXHIBIT D**

**SAMPLE FORM OF TERMS OF LETTER OF CREDIT**

1. **AMOUNT:** The amount of this letter of credit shall be for the sum of \_\_\_\_\_.

(Amount of Contract)

2. **TERM:** The term of this letter of credit shall be in effect and irrevocable for a period commencing on the date of execution of the agreement between the County of Camden and \_\_\_\_\_.

(Name of Contractor)

and terminating one (1) year after the date of completion and final acceptance by the County of the work performed pursuant to Camden County Bid No.:

\_\_\_\_\_.

(Bid No. and description of services/material to be provided)

3. **CAUSES FOR PROCEEDING AGAINST LETTER OF CREDIT:** The County shall have the absolute right to proceed against this letter of credit if:

(a) Contractor shall fail to faithfully perform according to the terms of the contract and Camden County Bid No. \_\_\_\_\_, or any changes or modifications therein made as therein provided; or Contractor shall fail to indemnify and save harmless the County of Camden, its officers, agents and servants, and each and every one of them against and from all suits and costs of every kind and description and from all damages which the County, or any of its officers, agents or servants may be put by reason of injury to the person or property of others resulting from the performance of said work or through the negligence of Contractor, or through any improper or defective machinery, implements or appliances used by contractor in the aforesaid work or through any act or omission on the part of Contractor, its agents, servants or employees; or contractor shall fail to further indemnify and save harmless the County, its officers, agents and servants from all suits and actions of any kind or character whatsoever, which may be brought or instituted by any subcontractors, materialman or laborer who has performed work or furnished materials in or about the work required to be done pursuant to said contract, or by or on account of, any claims or amount recovered for any infringement of patent, trademark, or copyright; or \_\_\_\_\_

(Name of Bank)



agreeing and assenting that this undertaking shall be for the benefit of any subcontractor, materialman, laborer, person, firm or corporation having a just claim, as well as for the County of Camden, whether or not the said material and labor enter into and become component parts of the work or improvement or in any amendment, extension or addition to said contract; or

(b) Contractor shall fail to pay all lawful sums of subcontractors, materialman, laborers, persons, firms or corporations for labor performed or materials, provisions, provender or other supplies or teams, fuels, oils, implements or machinery furnished, used or consumed in the carrying forward, performing or completing of said contract; or

(c) Contractor shall fail to well and truly keep and perform all the obligations, agreements, terms and conditions of such contract, on its part to be kept and performed and Contractor shall be responsible for poor workmanship done or poor materials furnished under said contract for a period of one (1) year from the date of the completion and final acceptance by the County of Camden, and Contractor shall pay for all labor performed and furnished and for all materials used in correcting any poor workmanship done and replacing any poor materials furnished.

It is further agreed that any alterations which may be made in the terms of the contract or in the work to be done or materials to be furnished or labor to be supplied or performed under it or the giving by the County of Camden of any extension of time for the performance of the contract shall not in any way release Contractor, its heirs, executors, administrators, successors or assigns, from its liability hereunder.

**NOTE: Letter of Credit must be signed by an authorized agent or representative of a bank or similar financial institution and not by the individual or company submitting the bid.**

**EXHIBIT E**  
**STATEMENT OF OWNERSHIP DISCLOSURE**

N.J.S.A. 52:25-24.2 (P.L. 1977, c.33, as amended by P.L. 2016, c.43)

**This statement shall be completed, certified to, and included with all Bid and Competitive Contracting RFP submissions. Failure to submit the required information is cause for automatic rejection of the bid or proposal.**

**Name of Organization:** \_\_\_\_\_

**Organization Address:** \_\_\_\_\_

**Part I      Check the box that represents the type of business organization:**

- ☐ Sole Proprietorship (skip Parts II and III, execute certification in Part IV)
- ☐ Non-Profit Corporation (skip Parts II and III, execute certification in Part IV)
- ☐ For-Profit Corporation (any type)                      ☐ Limited Liability Company (LLC)
- ☐ Partnership                      ☐ Limited Partnership                      ☐ Limited Liability Partnership (LLP)
- ☐ Other (be specific): \_\_\_\_\_

**Part II**

- ☐ The list below contains the names and **HOME addresses** of all individual 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. (**COMPLETE THE LIST BELOW IN THIS SECTION**)

**OR**

- ☐ No one stockholder in the corporation owns 10 percent or more of its stock, of any class, or no individual partner in the partnership owns a 10 percent or greater interest therein, or no member in the limited liability company owns a 10 percent or greater interest therein. (**SKIP TO PART IV**)

(Please attach additional sheets if more space is needed):

Name of Individual or Business Entity	Must list Home Address for Individuals

**Part III DISCLOSURE OF 10% OR GREATER OWNERSHIP IN THE STOCKHOLDERS, PARTNERS OR LLC MEMBERS LISTED IN PART II**

**If a bidder has a direct or indirect parent entity which is publicly traded, and any person holds a 10 percent or greater beneficial interest in the publicly traded parent entity as of the last annual federal Security and Exchange Commission (SEC) or foreign equivalent filing, ownership disclosure can be met by providing links to the website(s) containing the last annual filing(s) with the federal Securities and Exchange Commission (or foreign equivalent) that contain the name and address of each person holding a 10% or greater beneficial interest in the publicly traded parent entity, along with the relevant page numbers of the filing(s) that contain the information on each such person. Attach additional sheets if more space is needed.**

<b>Website (URL) containing the last annual SEC (or foreign equivalent) filing</b>	<b>Page #'s</b>

**Please list the names and HOME addresses of each stockholder, partner or member owning a 10 percent or greater interest in any corresponding corporation, partnership and/or limited liability company (LLC) listed in Part II other than for any publicly traded parent entities referenced above. 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 pursuant to N.J.S.A. 52:25-24.2 has been listed. Attach additional sheets if more space is needed.**

<b>Stockholder/Partner/Member and Corresponding Entity Listed in Part II</b>	<b>Home Address (for Individuals) Business Address (for Corporate Entity)</b>

**Part IV Certification**

I, being duly sworn upon my oath, hereby represent that the foregoing information and any attachments thereto to the best of my knowledge are true and complete. I acknowledge: that I am authorized to execute this certification on behalf of the bidder/proposer; that **Camden County** is relying on the information contained herein and that I am under a continuing obligation from the date of this certification through the completion of any contracts with **Camden County** to notify **Camden County** in writing of any changes to the information contained herein; that I am aware that it is a criminal offense to make a false statement or misrepresentation in this certification, and if I do so, I am subject to criminal prosecution under the law and that it will constitute a material breach of my agreement(s) with **Camden County** permitting **Camden County** to declare any contract(s) resulting from this certification void and unenforceable.

<b>Full Name (Print):</b>		<b>Title:</b>	
<b>Signature:</b>		<b>Date:</b>	

**EXHIBIT F**

**NON-COLLUSION AFFIDAVIT**

STATE OF                    )  
COUNTY OF                )

I, \_\_\_\_\_ of the City of \_\_\_\_\_ in the County of, \_\_\_\_\_  
and the State of \_\_\_\_\_ of full age, being dully sworn according to law on my oath depose and say  
that: I am \_\_\_\_\_ of the firm of \_\_\_\_\_ the bidder making this Proposal for the above named project,  
and that I executed the said Proposal with full authority to do so; that said bidder had not, directly or  
indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action in  
restraint of free, competitive bidding in connection with the above named project; and that all statements  
contained in said Proposal and in this affidavit are true and correct, and made with full knowledge that  
the State of New Jersey relies upon the truth of the statements contained in said Proposal and in the  
statements contained in this affidavit in awarding the contract for the said project.

I further warrant that no person or selling agency has been employed or retained to solicit or secure  
such contract upon an agreement or understanding for a commission, percentage, brokerage or  
contingent fee, except bona fide employees or bona fide established commercial or selling agencies  
maintained by \_\_\_\_\_ (N.J.S.A. 52:34-15)

(Name of Contractor)

Subscribed and sworn to  
before me this \_\_\_\_\_ day  
of \_\_\_\_\_, 20\_\_

\_\_\_\_\_  
Notary Public

\_\_\_\_\_  
(Also type or print name of bidder  
under signature)

## **EXHIBIT G**

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

#### **GOODS, PROFESSIONAL SERVICE AND GENERAL SERVICE CONTRACTS**

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

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

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

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

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

The contractor or subcontractor agrees to make good faith efforts to meet targeted county employment goals established in accordance with N.J.A.C. 17:27-5.2.

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

The contractor or subcontractor agrees to revise any of its testing procedures, if necessary, to assure that all personnel testing conforms with the principles of job-related testing, as established by

the statutes and court decisions of the State of New Jersey and as established by applicable Federal law and applicable Federal court decisions.

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

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

1. Letter of Federal Affirmative Action Plan Approval
2. Certificate of Employee Information Report
3. Employee Information Report Form AA302 (electronically provided by the Division and distributed to the public agency through the Division's website at [www.state.nj.us/treasury/contract\\_compliance](http://www.state.nj.us/treasury/contract_compliance))

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

## **EXHIBIT H**

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

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

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

(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 apprenticeship policies in any applicable collective bargaining agreement or union hiring hall arrangement, and, where required by custom or agreement, it shall send journeymen and trainees to the union for referral, or to the apprenticeship program for admission, pursuant to such agreement or arrangement. However, where the practices of a union or apprenticeship program will result in the exclusion of minorities and women or the failure to refer minorities and women consistent with the targeted county employment goal, the contractor or subcontractor shall consider for employment persons referred pursuant to (B) above without regard to such agreement or arrangement; provided further, however, that the contractor or subcontractor shall not be required to employ women and minority advanced trainees and trainees in numbers which result in the employment of advanced trainees and trainees as a percentage of the total workforce for the construction trade, which percentage significantly exceeds the apprentice to journey worker ratio specified in the applicable collective bargaining agreement, or in the absence of a collective bargaining agreement, exceeds the ratio established by practice in the area for said construction trade. Also, the contractor or subcontractor agrees that, in implementing the procedures of (B) above, it shall, where applicable, employ minority and women workers residing within the geographical jurisdiction of the union.

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

**EXHIBIT I**

**QUESTIONNAIRE ON SUPPLY/SERVICE CONTRACTS**

Please complete this questionnaire and submit it with your bid. Any necessary forms will be sent to you by the County upon award.

1. Our Company has a Federal Affirmative Action Plan Approval.

YES \_\_\_\_\_ NO \_\_\_\_\_

A. If yes, submit a photostatic copy of said approval.

B. If no, submit a photostatic copy of the New Jersey Certificate of Employee Information Report.

NONE OF THE ABOVE \_\_\_\_\_

2. We have neither State nor Federal Affirmative Action evidence. Please send us Form AA-302 (Affirmative Action Employee Information Report application). (Check if applicable \_\_\_\_\_).

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

NAME: \_\_\_\_\_

SIGNATURE: \_\_\_\_\_

TITLE: \_\_\_\_\_

DATE: \_\_\_\_\_

**AN EQUAL OPPORTUNITY EMPLOYER**

**EXHIBIT J**

**AFFIRMATIVE ACTION PLAN MBE/WBE TRACKING FORM**

**Definitions:**

A **Minority Business Enterprise (MBE)** is defined in the Camden County Affirmative Action Plan as "a business which is independently owned and operated and is at least 51% owned and controlled by minority group members". Minority group members are defined in the Camden County Affirmative Action Plan as "persons who are Black, Hispanic, Portuguese, Asian-American, American Indian or Alaskan Natives"

A **Women Business (WBE)** is defined in the Camden County Affirmative Action Plan as "a business which is independently owned and operated and is at least 51% owned and controlled by women".

Using the definitions above, please check the following space which best describes your firm:

\_\_\_\_\_ **Minority Business Enterprise (MBE)**

\_\_\_\_\_ **Women Business Enterprise (WBE)**

\_\_\_\_\_ **Neither**

**EXHIBIT K**

**CERTIFICATION REGARDING THE DEBARMENT, SUSPENSION,  
INELIGIBILITY AND VOLUNTARY EXCLUSION -  
LOWER TIER COVERED TRANSACTIONS**

I am \_\_\_\_\_ of the firm of \_\_\_\_\_,  
(your title) (name of your organization)  
\_\_\_\_\_  
(address of your organization)

**CHOOSE ONE OF THE FOLLOWING**

- ( ) A. I hereby certify on behalf of \_\_\_\_\_ that  
(name of your organization)  
  
neither it nor its principals are debarred, suspended, proposed for debarment, declared  
ineligible, or voluntarily excluded from participation in this transaction by any federal or state  
department, agency, or office.
- ( ) B. I am unable to certify to any of the statements set forth in this certification. I have  
attached an explanation to this form.

\_\_\_\_\_  
(Signature)

\_\_\_\_\_  
(Type Name & Title)

\_\_\_\_\_  
(Date)

## **INSTRUCTIONS FOR CERTIFICATION**

1. By signing and submitting this certification, the contracting firm is providing the certification as set out below.
2. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the contracting firm knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government and/or State Government, the County may pursue available remedies including suspension and/or debarment.
3. The contracting firm shall provide immediate written notice to the County if at any time, it learns that its certification was erroneous when submitted or has become erroneous because of changed circumstances.
4. The terms "covered transaction", "debarred", "suspended", "ineligible", "lower tier covered transaction", "participant", "person", "primary covered transaction", "principal", and "voluntarily excluded", as used in this clause, have the meanings set out in the Definitions and Coverage sections of rules implementing Executive Order 12549. You may contact the County for assistance in obtaining a copy of those regulations.
5. The contracting firm agrees by submitting this certification that, should the covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction.
6. The contracting firm further agrees by submitting this certification that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion - Lower Tier Covered Transaction," without modification, in all subcontracts to this agreement as authorized by the County.

**EXHIBIT L**

**EXTENSION OF PRICES TO REGISTERED SYSTEM MEMBERS (OTHER AGENCIES)**

The undersigned is further:  
**(ONE BOX ONLY MUST BE CHECKED)**

☐

WILLING to provide the item(s) herein bid upon to registered system members of the **Camden County Cooperative Pricing System, System Identifier No. 57-CCCPS**, without substitution or deviation from specifications, size, features, quality, price or availability as herein set forth. It is understood that orders will be placed directly by the registered members identified herein by separate contract, subject to the overall terms of the Master Contract to be awarded by the County of Camden, and that no additional service or delivery charges will be allowed except as permitted by these specifications.

☐

NOT WILLING to extend prices to registered system members of the **Camden County Cooperative Pricing System, System Identifier No. 57-CCCPS**, who have submitted estimates as described above. It is understood that this will not adversely affect consideration of this bid with respect to the needs of Camden County as the Lead Agency.

**EXHIBIT M**

**DISCLOSURE OF SUBCONTRACTORS AND SITES  
AND CERTIFICATION OF COMPLIANCE**

**(FOR BIDS FOR TEXTILES AND/OR ITEMS OF APPAREL ONLY)**

1. **DISCLOSURE OF SUBCONTRACTORS AND SITES – SEE PARAGRAPH 23.1**

a. List the name and address of each subcontractor to be used in the provision of the goods or services which are the subject of this bid. If extra space is required, please attach additional pages as needed.

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b. List the name and address of all locations, including subcontractor locations, substantially involved in the production of the goods or services which are the subject of this bid. If extra space is required, please attach additional pages as needed.

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2. **CERTIFICATION OF COMPLIANCE – SEE PARAGRAPH 23.2**

I hereby certify that each of the above-referenced locations, including subcontractor locations, substantially involved in producing or distributing the goods or services which are the subject of this bid, meet the standards set forth in Paragraph 23.2 of these specifications.

\_\_\_\_\_  
(Signature)

\_\_\_\_\_  
(Type Name & Title)

\_\_\_\_\_  
(Date)



## **EXHIBIT N**

### **BIDS FOR CONSTRUCTION DISCLOSURE OF SUBCONTRACTORS**

Please list the subcontractors for the specialty trade categories listed below. If you intend to perform the work through your own employees or by yourself rather than through utilization of a subcontractor, write the word "In-House" next to each applicable category and insert the name, and license number where required, of each person in the appropriate spaces. If the contract does not involve a specialty trade listed below, write the word "None" in the appropriate space. For further instructions, see Paragraph 26 herein. **DO NOT LEAVE ANY SPACE BLANK.**

**1. Plumbing and Gas Fitting and All Kindred Work:**

Name: N/A

Address: \_\_\_\_\_

License Number: \_\_\_\_\_

**2. Steam Power Plants, Steam and Hot Water Heating and Ventilating Apparatus, and All Kindred Work:**

Name: N/A

Address: \_\_\_\_\_

License Number: Not Applicable

**3. Electrical Work:**

Name: N/A

Address: \_\_\_\_\_

License Number: \_\_\_\_\_

**4. Structural Steel and Ornamental Iron Work:**

Name: \_\_\_\_\_

Address: \_\_\_\_\_

License Number: Not Applicable

**EXHIBIT O**

**AFFIDAVIT OF COMPLIANCE WITH INSTRUCTIONS TO BIDDERS  
PARAGRAPH 27 – SIGNIFICANT PUBLIC WORKS PROJECTS**

***NOTE: THE BIDDER AND EACH SPECIALTY TRADE SUBCONTRACTOR AS DEFINED IN PARAGRAPHS 26 & 27 ABOVE MUST EACH COMPLETE A SEPARATE AFFIDAVIT TO BE SUBMITTED WITH THE BID. ALL OTHER SUBCONTRACTORS MUST EACH COMPLETE THIS FORM PRIOR TO COMMENCING WORK. USE AS MANY COPIES OF THIS AFFIDAVIT FORM AS NECESSARY. Must be submitted with the bid or bid will be deemed noncompliant. Failure to submit required Exhibit O(s) is a material defect causing the bid to be rejected.***

STATE OF NEW JERSEY:

SS:

COUNTY OF CAMDEN:

The undersigned, of full age, being duly sworn according to law, upon his oath, deposes and says:

1. I have read the specifications for this bid, including Instructions To Bidders, Paragraph 27 – Significant Public Works Projects, and I am aware that Camden County has adopted a resolution establishing workforce standards for significant public works projects. **I am aware that these workforce standards make the following a material requirement of this bid:**

All workers employed on this significant public works project, whether employees of the contractor or any subcontractor, shall have the benefit of the availability of an apprentice training program in the appropriate trade(s), registered in the State of New Jersey, with the United States Department of Labor, Bureau of Apprenticeship and Training.

2. **You MUST choose one of the following:**

- a. \_\_\_\_\_ My company has an apprentice training program in the appropriate trade(s), registered in the State of New Jersey, with the United States Department of Labor, Bureau of Apprenticeship and Training. The registration number for this apprentice training program is NJ (or other State) # \_\_\_\_\_ ; or
- b. \_\_\_\_\_ My company will not employ any worker of less than journeyman status on this project.

**Note: Camden County will monitor the worksite to ensure compliance with this material provision and may, in its sole discretion, terminate the contract of any company found to be in violation.**

Sworn to and Subscribed

before me this       day

of                      , 20\_\_\_\_.

\_\_\_\_\_  
NOTARY PUBLIC

\_\_\_\_\_  
MY SIGNATURE

\_\_\_\_\_  
MY NAME (PRINT OR TYPE)

\_\_\_\_\_  
COMPANY NAME

## **EXHIBIT P**

### **AMERICANS WITH DISABILITIES ACT Mandatory Language**

#### **Equal Opportunity for Individuals with Disabilities.**

The Contractor and the County do hereby agree that the provisions of Title II of the Americans With Disabilities Act of 1990 (the "Act") (42 U.S.C. s12101 et seq.), which prohibits discrimination on the basis of disability by public entities in all services, programs, and activities provided or made available by public entities, and the rules and regulations promulgated pursuant thereunto, are made a part of this contract. In providing any aid, benefit, or service on behalf of the County pursuant to this contract, the Contractor agrees that the performance shall be in strict compliance with the Act. In the event that the Contractor, its agents, servants, employees, or subcontractors violate or are alleged to have violated the Act during the performance of this contract, the Contractor shall defend the County in any action or administrative proceeding commenced pursuant to this Act. The Contractor shall indemnify, protect, and save harmless the County, its agents, servants, and employees from and against any and all suits, claims, losses, demands, or damages of whatever kind or nature arising out of or claimed to arise out of the alleged violation. The Contractor shall, at its own expense, appear, defend, and pay any and all charges for legal services and any and all costs and other expenses arising from such action or administrative proceeding or incurred in connection therewith. In any and all complaints brought pursuant to the County's grievance procedure, the Contractor agrees to abide by any decision of the County, which is rendered pursuant to, said grievance procedure. If any action or administrative proceeding results in an award of damages against the County or if the County incurs any expense to cure a violation of the ADA which has been brought pursuant to its grievance procedure, the Contractor shall satisfy and discharge the same at its own expense.

The County shall, as soon as practicable after a claim has been made against it, give written notice thereof to the Contractor along with full and complete particulars of the claim. If any action or administrative proceeding is brought against the County or any of its agents, servants, and employees, the County shall expeditiously forward or have forwarded to the Contractor every demand, complaint, notice, summons, pleading, or other process received by the County or its representatives.

It is expressly agreed and understood that any approval by the County of the services provided by the Contractor pursuant to this contract will not relieve the Contractor of the obligation to comply with the Act and to defend, indemnify, protect, and save harmless the Owner pursuant to this paragraph.

It is further agreed and understood that the Owner assumes no obligation to indemnify or save harmless the Contractor, its agents, servants, employees and subcontractors for any claim which may arise out of their performance of this agreement. Furthermore, the Contractor expressly understands and agrees that the provisions of this indemnification clause shall in no way limit the Contractor's obligations assumed in this agreement, nor shall they be construed to relieve the Contractor from any liability, nor preclude the Owner from taking any other actions available to it under any other provisions of this agreement or otherwise at law.

**EXHIBIT Q**

**COUNTY OF CAMDEN  
ACKNOWLEDGEMENT OF RECEIPT OF ADDENDA**

**BIDDER REQUIRED TO COMPLETE AND RETURN FORM WITH BID REGARDLESS OF  
WHETHER ADDENDA WAS ISSUED.  
FAILURE TO COMPLETE AND RETURN FORM IS A FATAL DEFECT WHICH CANNOT BE  
CURED AND BID WILL BE REJECTED.**

**A.** Bidder hereby acknowledges receipt of the following Addenda:

<u>Addendum Number</u>	<u>Dated</u>	<u>Initial</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

**OR:**

**B.** Bidder acknowledges to the best of his/her knowledge no addendum has been issued by the  
County: \_\_\_\_\_ Dated \_\_\_\_\_ Initial \_\_\_\_\_

**Bidder is required to complete, sign and submit form with bid regardless of whether addenda  
were issued. Failure to complete and return form is a fatal defect which cannot be cured and  
bid will be rejected. See: N.J.S.A. 40A:11-23.2**

By: \_\_\_\_\_  
(Print or Type Name of Authorized Individual)

Signature: \_\_\_\_\_

Title: \_\_\_\_\_

**EXHIBIT R**

**COUNTY OF CAMDEN  
UNIFORMED LAW ENFORCEMENT OFFICERS REQUIREMENT**

Pursuant to N.J.S.A. 40A:11-23.1(c), the County has determined the following:

- ( ☒ )      Uniformed law enforcement officers **are not required** for the project.
- (    ☐ )      Uniformed law enforcement officers **are required** for the project.

Reasonable estimate of costs for the following:

traffic control personnel	\$ _____
vehicles	\$ _____
equipment	\$ _____
administrative	\$ _____
other (specify)	
_____	\$ _____
_____	\$ _____
_____	\$ _____
_____	\$ _____
Total costs	\$ _____

The above costs associated with additional traffic control required by the County have been reasonably estimated in cooperation and consultation with the following municipalities affected by the project.

Name of Municipality	Contact person
_____	_____
_____	_____
_____	_____
_____	_____

**EXHIBIT S**  
**DISCLOSURE OF INVESTMENT ACTIVITIES IN IRAN**  
**PART 1: CERTIFICATION**

**BIDDERS MUST COMPLETE PART 1 BY CHECKING EITHER BOX. FAILURE TO CHECK ONE OF THE BOXES WILL RENDER THE PROPOSAL NON-RESPONSIVE.**

Pursuant to N.J.S.A. 52:32-55, any person or entity that submits a bid or proposal or otherwise proposes to enter into or renew a contract must complete the certification below to attest, under penalty of perjury, that neither the person or entity, nor any of its parents, subsidiaries, or affiliates, is identified on the Department of Treasury's Chapter 25 list (N.J.S.A. 51:32-57) as a person or entity engaging in investment activities in Iran. The Chapter 25 list is found on the Division's website at: <http://www.state.nj.us.treasury/purchase/pdf/Chapter25List.pdf>

Bidders **must** review this list prior to completing the below certification. **Failure to complete the certification and return it with the bid will render a bidder's proposal non-responsive and the bid will be rejected.** If the Director finds a person or entity to be in violation of law, s/he shall take action as may be appropriate and provided by law, rule or contract, including but not limited to, imposing sanctions, seeking compliance, recovering damages, declaring the party in default and seeking debarment or suspension of the party.

**PLEASE CHECK THE APPROPRIATE BOX:**

- ☐ I certify, pursuant to N.J.S.A. 52:32-55, that neither the bidder listed above nor any of the bidder's parents, subsidiaries, or affiliates is listed on the N.J. Department of the Treasury's list of entities determined to be engaged in prohibited activities in Iran pursuant to the statute and the Chapter 25 List. I further certify that I am the person listed above, or I am an officer or representative of the entity listed above and am authorized to make this certification on its behalf. I will skip Part 2 and sign and complete the Certification below.

**OR**

- ☐ I am unable to certify as above because the bidder and/or one or more of its parents, subsidiaries, or affiliates is listed on the Department's Chapter 25 List. I will provide a detailed, accurate and precise description of the activities in Part 2 below and sign and complete the Certification below. Failure to provide such will result in the proposal being rendered as non-responsive and appropriate penalties, fines and/or sanctions will be assessed as provided by law.

**PART 2: PLEASE PROVIDE FURTHER INFORMATION RELATED TO INVESTMENT  
ACTIVITIES IN IRAN - add additional sheets if necessary.**

You must provide a detailed, accurate and precise description of the activities of the bidding person/entity, or one of its parents, subsidiaries or affiliates, engaging in the investment activities in Iran outlined above by completing below:

Name of Entity: \_\_\_\_\_; Relationship to Bidder: \_\_\_\_\_

Description of  
Activities: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Duration of Engagement: \_\_\_\_\_ Anticipated Cessation Date: \_\_\_\_\_

Bidder/Offeror Contact Name: \_\_\_\_\_; Contact Phone: \_\_\_\_\_

**Sign Certification - next page**

**EXHIBIT S - continued**

**DISCLOSURE OF INVESTMENT ACTIVITIES IN IRAN**

**BIDDER:** \_\_\_\_\_

**Certification:**

**I, being duly sworn upon my oath, hereby represent that the foregoing information and any attachments thereto to the best of my knowledge are true and complete. I acknowledge that I am authorized to execute this certification on behalf of the bidder, that the County of Camden is relying on the information contained herein and that I am under a continuing obligation from the date of this certification through the completion of any contracts with the County to notify the County in writing of any changes to the information contained herein; that I am aware that it is a criminal offense to make a false statement or misrepresentation in this certification, and if I do so, I am subject to criminal prosecution under the law and that it will constitute a material breach of my agreement(s) with the County of Camden, permitting the County to declare any contract(s) resulting from this certification void and unenforceable.**

Full Name (Print): \_\_\_\_\_

Signature: \_\_\_\_\_

Title: \_\_\_\_\_

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



## **EXHIBIT T**

### **NEW JERSEY ANTI-DISCRIMINATION PROVISIONS**

#### **N.J.S.A. 10:2-1 et seq.**

Pursuant to N.J.S.A. 10:2-1, if awarded a contract, the contractor agrees that:

- a. In the hiring of persons for the performance of work under this contract or any subcontract hereunder, or for the procurement, manufacture, assembling or furnishing of any such materials, equipment, supplies or services to be acquired under this contract, no contractor, nor any person acting on behalf of such contractor or subcontractor, shall, by reason of race, creed, color, national origin, ancestry, marital status, gender identity or expression, affectional or sexual orientation or sex, discriminate against any person who is qualified and available to perform the work to which the employment relates;
- b. No contractor, subcontractor, nor any person on his behalf shall, in any manner, discriminate against or intimidate any employee engaged in the performance of work under this contract or any subcontract hereunder, or engaged in the procurement, manufacture, assembling or furnishing of any such materials, equipment, supplies or services to be acquired under such contract, on account of race, creed, color, national origin, ancestry, marital status, gender identity or expression, affectional or sexual orientation or sex;
- c. There may be deducted from the amount payable to the contractor by the contracting public agency, under this contract, a penalty of \$50.00 for each person for each calendar day during which such person is discriminated against or intimidated in violation of the provisions of the contract; and
- d. This contract may be canceled or terminated by the contracting public agency, and all money due or to become due hereunder may be forfeited, for any violation of this section of the contract occurring after notice to the contractor from the contracting public agency of any prior violation of this section of the contract.

No provision in this section shall be construed to prevent a board of education from designating that a contract, subcontract or other means of procurement of goods, services, equipment or construction shall be awarded to a small business enterprise, minority business enterprise or a women's business enterprise pursuant to P.L.1985, c.490 (C.18A:18A-51 et seq.).

**BID FORM  
GENERAL CONTRACTOR**

The work included under this bid proposal includes all labor, superintendence, materials, tools, transportation, plant and equipment and all means of construction necessary and reasonably incidental to complete **all work and associated improvements excluding electrical, mechanical, and plumbing work** to be performed under the Base Bid as specified in the Bid Documents and Specifications for “Renovation and Modernization | Regan Building” as prepared by Bach Associates, PC and dated October 19, 2020. Materials and labor obviously a part of the work and necessary for the proper installation and/or operation of same, although not specifically indicated on the Contract Drawings, the specifications, and /or listed on this Proposal bid form and will be provided as if called out in detail at no additional cost to the Owner.

The Bidder has carefully examined the specifications, plans and form of contract for the project named above. The Bidder has made himself familiar with the site, and will contract to carry out and complete said project as specified and delineated at the price per unit measure or lump sum for each scheduled item of work stated in the following proposal.

It is understood that the Total Price for the entire contract stated by the undersigned in the Schedule is based on the estimated quantities and will control in the awarding of the contract. It is further understood that the quantities stated in this Schedule of Prices for the various items are estimated only and may be increased or decreased. Payment will be made only for the actual quantity of authorized work done under each scheduled item.

**The Bidder agrees that the price bid shall apply to actual quantities required, approved and used during the Work, including Addenda. He further agrees to complete the entire work for this Contract on or before Friday, December 11, 2020.**

**The bidder is aware that a preconstruction meeting is scheduled for Friday, October 30<sup>th</sup>, 10am at the project location. A notice to proceed will be issued at the preconstruction meeting with an effective date of Friday, October 30, 2020.**

The Bidder hereby agrees to be bound by the award of the Bid, and if awarded the Contract on this Bid, to execute the Contract and the required Bonds and Insurance Certificates, and to furnish all other information and documents required by the Contract Documents within the time limits specified.

The Bidder understands that County reserves the right to reject any or all Bids, or to waive any informality or technicality of any Bid, in the interest of the County.

If this Bid shall be accepted by County, and the Bidder shall fail to execute the Contract as aforesaid, then County shall be entitled to recover from the Bidder the Bid Bond, and any other penalty specified in the Contract Documents.

The signer of this Proposal as Bidder declares:

That he has received and examined the Contract Documents, including the Instructions to Bidders, Contract Agreement, General Conditions, Supplementary Conditions, Specifications, and Addenda, if any.

That he has examined the site of the work.

## BID FORM (CONTINUED)

In submitting this Proposal, Bidder agrees:

To accept the provisions of the Instructions for Bidders including disposition of Bid Security.

To enter into and execute a Contract, if awarded on the basis of this Proposal, and to furnish the Surety Bonds required by the General and Supplementary Conditions.

To accomplish the work in accordance with the Contract Documents and to complete the work in the time stipulated in the Information for Bidders.

**The bidder understands that a detailed and balanced schedule of values will be required under this contract. Schedule of Values is required to be submitted with bid package.** Bidder understands and agrees that not all items under the Owner approved schedule of values will be necessary under this contract and that the Owner may elect not to authorize the Contractor to perform work under an individual item(s). The bidder also understands that the Owner may increase or decrease the quantity of work to be done under any item and that the Contractor will only be paid for actual quantity of work provided based on the prices delineated under the Owner approved schedule of values.

**The bidder understands that a detailed construction schedule will be required under this contract. Construction schedule is required to be submitted with bid package.**

The bidder understands that work included in this bid will be performed in parallel with work included in other bids. Bidder is responsible for coordinating bidder's work with other contractors during the course of construction within the building and on the project site.

It is recognized that no two pieces of equipment and no two products are engineered or designed exactly the same. Trade names, brand names and models specified herein are provided to establish a minimum standard of quality acceptable to the County for this bid. Substitute brands, makes and models shall be considered and reviewed on the basis of their ability to perform the specified tasks or provide the same quality of goods as specified in the County's bid. This is known as an "Equivalent".

If the bidder seeks to provide an Equivalent product or good, the bidder shall with its bid submission include specifications or cut sheets for such proposed Equivalent product or good. The County's Architect/Engineer for the bid shall review the submission provided by the bidder to determine whether the product or good is an Equivalent to the bid specification. The County's Architect/Engineer for the bid shall have the final decision on whether a bidder's submitted product specifications are an Equivalent to the named product(s) or good(s) in this bid.

Should any requirements in the contract documents be found to conflict with the County's general bid boilerplate (the ITB pages) the general bid boilerplate provisions and language shall prevail.

## **BID FORM (CONTINUED)**

If the Contractor fails to complete the project and each and every part and appurtenance thereof fully, entirely and in conformity with the provisions of the contract within the times stated in the contract, or within such further time as may have been granted in accordance with the provisions of the contract, then the County may withhold permanently from the Contract's total compensation the appropriate amount of \$500 for each and every day that the work remains incomplete, which said amount shall not be considered a penalty, but liquidated damages for the loss, inconvenience and extra expense to the County by such delays.

The Bidder proposes to furnish all labor, materials and equipment required to complete the work in every detail, in accordance with the plans, specifications and other contract documents prepared by Bach Associates, at and for the following Prices:

### **Base Bid**

The below (in numbers) and the following (in words) lump sum base bid includes all labor, superintendence, materials, tools, transportation, plant and equipment and all means of construction necessary and reasonably incidental to complete **all work and associated improvements excluding electrical, mechanical, and plumbing work** to be performed under the Base Bid as specified in the Bid Documents and Specifications for "Renovation and Modernization | Regan Building" as prepared by Bach Associates, PC and dated October 19, 2020.

Materials and labor obviously a part of the work and necessary for the proper installation and/or operation of same, although not specifically indicated on the Contract Drawings, the specifications, and /or listed on this Proposal bid form and will be provided as if called out in detail at no additional cost to the Owner.

### **Construction Allowance**

A \$100,000 lump sum allowance is to be included in the total price bid for Base Bid and is intended to be used if and where directed for work associated with the project, throughout the course of construction.

**Total allowance for this project is \$100,000 and must be included with total price bid.**

**SUBMITTED BID PACKAGE MUST INCLUDE IDENTIFICATION OF SUBCONTRACTORS AS LISTED IN CORRESPONDING EXHIBIT IN INSTRUCTIONS TO BIDDERS DOCUMENT.**

**BID FORM (CONTINUED)**

**Total Contract Amount BASE BID including \$100,000 CONSTRUCTION ALLOWANCE:**

Total Allowances and Fees: \$100,000

Bid Price exclusive of allowances and fees (In Numbers): \_\_\_\_\_

**TOTAL BID PRICE INCL. ALLOWANCES AND FEES** (In Numbers) \$ \_\_\_\_\_

(In words) \_\_\_\_\_

\_\_\_\_\_

Amount shall be shown in both words and figures. In case of discrepancy, the amount shown in words shall govern).

**BIDDER'S SIGNATURE:**

A. If a Corporation:

Name of Bidder: \_\_\_\_\_

Authorized Signature: \_\_\_\_\_

Name of Person Signing: \_\_\_\_\_

Title of Person Signing: \_\_\_\_\_

Dated: \_\_\_\_\_

Business Address: \_\_\_\_\_

Business Telephone Number: \_\_\_\_\_

Incorporated under the laws of the State of: \_\_\_\_\_

B. If a Partnership, Individual, or Non-Incorporated Organization:

Name of Business Entity: \_\_\_\_\_

Authorized Signature: \_\_\_\_\_

Name of Person Signing: \_\_\_\_\_

Title of Person Signing: \_\_\_\_\_

Dated: \_\_\_\_\_

Business Address: \_\_\_\_\_

Business Telephone Number: \_\_\_\_\_

END OF DOCUMENT

## **APPENDIX**

A201 GENERAL CONDITIONS

54 pages

PREVAILING WAGE RATES

1 page

## A201 GENERAL CONDITIONS



# AIA<sup>®</sup> Document A201<sup>™</sup> – 2007

## General Conditions of the Contract for Construction

for the following PROJECT:

(Name and location or address) Renovation and  
Renovation and Modernization  
Regan Building  
508 Lakeland Road, Camden, NJ 08012

THE OWNER:

(Name, legal status and address)  
Camden County  
520 Market Street  
Camden, New Jersey 08102

THE ARCHITECT:

(Name, legal status and address)  
Bach Associates, PC  
304 White Horse Pike  
Haddon Heights, New Jersey 08035

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### ADDITIONS AND DELETIONS:

The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

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## ARTICLE 1 GENERAL PROVISIONS

### § 1.1 BASIC DEFINITIONS

#### § 1.1.1 THE CONTRACT DOCUMENTS

The Contract Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter the Agreement) and consist of the Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive or (4) a written order for a minor change in the Work issued by the Architect.

#### § 1.1.2 THE CONTRACT

The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Contractor and the Architect or the Architect's consultants, (2) between the Owner and a Subcontractor or a Sub-subcontractor, (3) between the Owner and the Architect or the Architect's consultants or (4) between any persons or entities other than the Owner and the Contractor. The Architect shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of the Architect's duties.

#### § 1.1.3 THE WORK

The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

#### § 1.1.4 THE PROJECT

The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the Owner and by separate contractors.

#### § 1.1.5 THE DRAWINGS

The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules and diagrams.

#### § 1.1.6 THE SPECIFICATIONS

The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services.

#### § 1.1.7 INSTRUMENTS OF SERVICE

Instruments of Service are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work performed by the Architect and the Architect's consultants under their respective professional services agreements. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials.

#### § 1.1.8 INITIAL DECISION MAKER

The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.2 and certify termination of the Agreement under Section 14.2.2.

### § 1.2 CORRELATION AND INTENT OF THE CONTRACT DOCUMENTS

§ 1.2.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.

§ 1.2.2 Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

§ 1.2.3 Unless otherwise stated in the Contract Documents, words that have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

### § 1.3 CAPITALIZATION

Terms capitalized in these General Conditions include those that are (1) specifically defined, (2) the titles of numbered articles or (3) the titles of other documents published by the American Institute of Architects.

### § 1.4 INTERPRETATION

In the interest of brevity the Contract Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an," but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

### § 1.5 OWNERSHIP AND USE OF DRAWINGS, SPECIFICATIONS AND OTHER INSTRUMENTS OF SERVICE

§ 1.5.1 The Architect and the Architect's consultants shall be deemed the authors and owners of their respective Instruments of Service, including the Drawings and Specifications, and will retain all common law, statutory and other reserved rights, including copyrights. The Contractor, Subcontractors, Sub-subcontractors, and material or equipment suppliers shall not own or claim a copyright in the Instruments of Service. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with this Project is not to be construed as publication in derogation of the Architect's or Architect's consultants' reserved rights.

§ 1.5.2 The Contractor, Subcontractors, Sub-subcontractors and material or equipment suppliers are authorized to use and reproduce the Instruments of Service provided to them solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and material or equipment suppliers may not use the Instruments of Service on other projects or for additions to this Project outside the scope of the Work without the specific written consent of the Owner, Architect and the Architect's consultants.

### § 1.6 TRANSMISSION OF DATA IN DIGITAL FORM

If the parties intend to transmit Instruments of Service or any other information or documentation in digital form, they shall endeavor to establish necessary protocols governing such transmissions, unless otherwise already provided in the Agreement or the Contract Documents.

### § 1.7 EXECUTION OF CONTRACT DOCUMENTS

§ 1.7.1 The Contract Documents shall be signed by the Owner and Contractor. If either the Owner or Contractor or both do not sign all the Contract Documents, the Architect shall identify such unsigned Documents upon Request. ***The Agreement shall be signed in not less than quadruplicate by the Owner and Contractor.***

§ 1.7.2 Execution of the contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with the local conditions under which the Work is to be performed and correlated personal observations with requirements of the Contract Documents. ***Execution of the contract by the Contractor is a representation that said Contract Documents are full and complete, are sufficient to have enabled the Contractor to determine the cost of the Work therein to enter into the Contract and that the Contract Documents are sufficient to enable it to construct the Work outlined therein, and otherwise to fulfill all its obligations hereunder, including, but not limited to, Contractor's obligation to construct the Work for an amount not in excess of the Contract Sum on or before the date(s) of Substantial Completion established in the Agreement. The Contractor further acknowledges and declares that it has visited and examined the site, examined all physical, legal, and other conditions affecting the Work and is fully familiar with all of the conditions thereon and thereunder affecting the same. In connection therewith, Contractor specifically represents and warrants to Owner that it has, by careful examination, satisfied itself as to: (1) the nature, location and character of the Project and the site, including, without limitation, the surface and subsurface conditions of the site and all structures and obstructions thereon and thereunder, both natural and man-made, and all surface and subsurface water conditions of the site and the surrounding area; (2) the nature, location, and character of the general area in which the Project is located, including without limitation, its climatic conditions, available labor supply and labor costs, and available equipment supply and equipment costs; and (3) the quality and quantity of all materials, supplies, tools, equipment, labor, and professional services necessary to complete the Work in the***

*manner and within the cost and time frame required by the Contract Documents, In connection with the foregoing, and having carefully examined all Contract Documents, as aforesaid, and having visited the site, the contractor acknowledges and declares that it has no knowledge of any discrepancies, omissions, ambiguities, or conflicts in said Contract Documents and that if it becomes aware of any such discrepancies, omissions, ambiguities, or conflicts, it will promptly notify Owner and Architect of such fact.*

**§ 1.7.3 The Contract Documents include all items necessary for the proper execution and completion of the Work by the Contractor. The Work shall consist of all items specifically included in the Contract Documents as well as all additional items of work which are reasonably inferable from that which is specified in order to complete the Work in accordance with the Contract Documents, The Contract Documents are complementary, and what is required by any one Contract Document shall be as binding as if required by all. Any differences between the requirements of the Drawings and the Specifications or any differences noted within the Drawings themselves or within the Specifications themselves have been referred to the Owner and Architect by Contractor prior to the submission of bids and have been clarified by an Addendum issued to all bidders.**

*If any such differences or conflicts were not called to the Owner's and Architect's attention prior to submission of bids, the Architect shall decide which of the conflicting requirements will govern based upon the most stringent of the requirements, and, subject to the approval of the Owner, the Contractor shall perform the Work at no additional cost and/or time to the Owner in accordance with the Architect's decision. Work not covered in the Contract Documents will not be required unless it is consistent therewith and is reasonably inferable therefrom as being necessary to produce the intended results.*

§ 1.7.3.1 The term "reasonably inferable" includes work necessary to "provide" work indicated or specified, as defined in section: Definitions and Standards; that is: furnish and install, complete, in place and ready for use.

§ 1.7.3.2 Details referenced to portions of the Work shall apply to other like portions of the Work not otherwise details.

§ 1.7.3.3 The Contractor shall request the Architect/Engineer's interpretation of apparent discrepancies, conflicts, or omissions in the Specifications and Drawings. Subcontractors shall forward such requests through the Contractor. Such requests, and the Architect/Engineer's interpretation, shall be in written form; other forms of communications shall be used to expedite resolution of concerns, but will not be binding.

§ 1.7.4 Explanatory notes shall take precedence over conflicting drawn note indications. Large scale drawings shall take precedence over small scale drawings. Figured dimensions shall take precedence over scaled measurements. Should contradictions be found, the Architect shall determine which indication is correct.

§ 1.7.5 When more than one material, brand, or process is specified for a particular item of Work, the choice shall be the Contractor's. Contractor may, after notifying the Architect and Owner, select the one it considers to be the best. Approval by Architect or Owner of materials, suppliers, processes, or Subcontractors does not imply a waiver of any Contract requirements including, without limitation, Contractor's warranty.

§ 1.7.6 In all cases, the details, drawings, and specifications shall be checked with existing conditions and with work in place, and variations, if any, shall be referred by the Contractor to the Architect for adjustment, as the Contractor will be responsible for the fit or work in place.

§ 1.7.7 When a profile, section or other finished condition is shown, furring or other method of obtaining such finished conditions shall be provided. The drawings may show work fully drawn out or only a portion thereof, the remainder being in outline, the drawn out portions apply to other like or similar places.

§ 1.7.8 Where it is required in the specifications that materials, products, processes, equipment, or the like be installed or applied in accordance with manufacturer's instructions, directions, or specifications, or words to this effect, it shall be construed to mean that said application or installation shall be in strict accordance with printed material concerned for use under conditions similar to those at the job site. Three copies of such instructions shall be furnished to the Architect and his written approval thereof obtained before work is begun.

§ 1.7.9 Any material specified by reference to the number, symbol, or title of a Commercial Standard, Federal Specification, ASTM Specification, trade association standard, or other similar standards, shall comply with the requirements in the latest revision thereof and any amendments or supplements thereto in effect one month prior to the date on which bids are opened and read except as limited to type, class, or grade, or modified in such reference. The standards referred to, except as modified in the specifications, shall have full force and effect as through printed in the specifications. The Architect will furnish upon request information as to how copies of the standards referred to may be obtained.

## ARTICLE 2 OWNER

### § 2.1 GENERAL

§ 2.1.1 The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization. Except as otherwise provided in Section 4.2.1, the Architect does not have such authority. The term "Owner" means the Owner or the Owner's authorized representative.

*(Paragraph deleted)*

### § 2.2 INFORMATION AND SERVICES REQUIRED OF THE OWNER

§ 2.2.1 The Owner shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness. The Owner shall also furnish any other information or services under the Owner's control and relevant to the Contractor's performance of the Work with reasonable promptness after receiving the Contractor's written request for such information or services.

§ 2.2.2 Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.2.

*(Paragraphs deleted)*

### § 2.3 OWNER'S RIGHT TO STOP THE WORK

If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 or fails to carry out Work in accordance with the Contract Documents, *or fails or refuses to provide a sufficient amount of properly supervised and coordinated labor, materials, or equipment so as to be able to complete the Work within the Contract Time or fails to remove and discharge (within ten days) any lien filed upon Owner's property by anyone claiming by, through, or under Contractor, or disregards the instructions of Architect or Owner when based on the requirements of the Contract Documents*, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity.

### § 2.4 OWNER'S RIGHT TO CARRY OUT THE WORK

If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a ten-day period after receipt of written notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such deficiencies. In such case an appropriate Change Order shall be issued deducting from payments then or thereafter due the Contractor the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Architect's additional services made necessary by such default, neglect or failure. Such action by the Owner and amounts charged to the Contractor are both subject to prior approval of the Architect. If payments then or thereafter due the Contractor are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner.

## ARTICLE 3 CONTRACTOR

### § 3.1 GENERAL

*(Paragraph deleted)*



§ 3.1.1.1 The term "Contractor" shall mean the respective Prime Contract person or entity identified as such in the Owner Contractor Agreement, for each respective Prime Construction Contract, as responsible for the supervisory control over allocation, coordination of all SubContractors or trades, performance and completion of all portions of the Work, including cooperation with those doing portions of the Work under Separate Contract with the Owner.

§ 3.1.1.2 The term "Contractor" shall mean and apply with equal force to each respective Prime Contractor and all other Contractors having a direct Contract with the Owner, or with each respective Contractor or other Prime Contractor for other branches of the Work, or his authorized representative.

§ 3.1.2 The Contractor shall not be relieved of obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Architect in the Architect's administration of the Contract, or by tests, inspections or approvals required or performed by persons other than the Contractor.

§ 3.1.2 The Contractor shall perform the Work in accordance with the Contract Documents.

§ 3.1.3 The Contractor shall not be relieved of obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Architect in the Architect's administration of the Contract, or by tests, inspections or approvals required or performed by persons or entities other than the Contractor.

### § 3.2 REVIEW OF CONTRACT DOCUMENTS AND FIELD CONDITIONS BY CONTRACTOR

§ 3.2.1 In addition to and not in derogation of Contractor's duties under Paragraph 1.7.2 and 1.7.3, the Contractor shall carefully study and compare the Contract Documents with each other and shall at once report to the Architect errors, inconsistencies or omissions discovered. The Contractor shall not be liable to the Owner or Architect for damage resulting from errors, inconsistencies or omissions in the Contract Documents that could not have been discovered by a prudent and experienced contractor in advance and that are not in the nature of items described in and intended to be covered in Paragraph 1.7.2 and 1.7.3 unless the Contractor recognized or reasonably should have recognized such error, inconsistency or omission and failed to report it to the Architect. If the Contractor performs any construction activity involving an error, inconsistency or omission in the Contract Documents that the Contractor recognized or reasonably should have recognized without such notice to the Architect, the Contractor shall Assume Complete Responsibility for such performance and shall bear the full amount of the attributable costs for correction.

§ 3.2.1.1 If any errors, inconsistencies, or omissions in Contract Documents are recognized or reasonably should have been recognized by the Contractor, any member of its organization, or any of its Subcontractors, the Contractor shall be responsible for notifying the Architect in writing of such error, inconsistency, or omission before proceeding with the Work. The Architect will take such notice under advisement and within a reasonable time commensurate with job progress render a decision. If Contractor fails to give such notice and proceeds with such Work, it shall correct any such errors, inconsistencies, or omissions at no additional cost to the Owner.

§ 3.2.1.2 Deviations from the Construction documents must be noted by the Prime Contractor at the time of shop drawing submission. Failure to do so will result in the implication of Section 3.2 of the General Conditions and Paragraph 3.2.1 and 3.2.1.1 above.

§ 3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.2.3, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Architect any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information in such form as the Architect may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

§ 3.2.3 The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, but the Contractor

shall promptly report to the Architect any nonconformity discovered by or made known to the Contractor as a request for information in such form as the Architect may require.

§ 3.2.4 If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Architect issues in response to the Contractor's notices or requests for information pursuant to Sections 3.2.2 or 3.2.3, the Contractor shall make Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.2 or 3.2.3, the Contractor shall pay such costs and damages to the Owner as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents, for differences between field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities.

### § 3.3 SUPERVISION AND CONSTRUCTION PROCEDURES

§ 3.3.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Contract, unless the Contract Documents give other specific instructions concerning these matters. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences or procedures, the Contractor shall evaluate the jobsite safety thereof and, except as stated below, shall be fully and solely responsible for the jobsite safety of such means, methods, techniques, sequences or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely written notice to the Owner and Architect and shall not proceed with that portion of the Work without further written instructions from the Architect. If the Contractor is then instructed to proceed with the required means, methods, techniques, sequences or procedures without acceptance of changes proposed by the Contractor, the Owner shall be solely responsible for any loss or damage arising solely from those Owner-required means, methods, techniques, sequences or procedures.

§ 3.3.2 The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons or entities performing portions of the Work for, or on behalf of, the Contractor or any of its Subcontractors.

§ 3.3.3 The Contractor shall be responsible for inspection of portions of Work already performed to determine that such portions are in proper condition to receive subsequent Work.

§ 3.3.4 The Contractor, when requested by the Architect, shall meet with representative of the Architect at all times and furnish all information requested; he shall allow the Architect to inspect the work at all times. Neither the Owner, nor the Architect shall be liable to the Contractor for extra compensation or damages for interference or delays on account of any such meetings, information, or inspections so requested or other acts of the Architect done in good faith and within the scope of their employment by the Owner.

§ 3.3.4.1 In addition the Contractor is entrusted with the oversight, management control, and general direction of this project to insure that all contract completion dates are met. In the event that there are any delays caused to any subcontractor on this project, liability shall lie with the Contractor and not with the Owner.

§ 3.3.5 The contractor has the responsibility to ensure that all material suppliers and Subcontractors, their agents, and employees adhere to the Contract Documents, and that they order materials on time, taking into account the current market and delivery conditions and that they provide materials on time. The Contractor shall coordinate its Work with that of all others on the Project including deliveries, storage, installations, and construction utilities. The contractor shall be responsible for the space requirements, locations, and routing of its equipment. In areas and locations where the proper and most effective space requirements, locations and routing cannot be made as indicated, the Contractor shall meet with all others involved, before installation, to plan the most effective and efficient method of overall installation.

§ 3.3.6 The Contractor shall establish and maintain bench marks and all other grades, lines and levels necessary for the Work, report errors or inconsistencies to the Architect before commencing Work, and review the placement of the building(s) and permanent facilities on the site with the Owner and Architect after all lines are staked out and

before foundation Work is started. Contractor shall provide access to the Work for the Owner, the Architect, other persons designated by Owner, and governmental inspectors. Any encroachments made by contractor or its Subcontractor (of any tier) on adjacent properties due to construction as revealed by an improvement survey, except for encroachments arising from errors or omissions not reasonably discoverable by Contractor in the Contract Documents, shall be the sole responsibility of the Contractor, and Contractor shall correct such encroachments within thirty (30 ) days of the improvement survey (or as soon thereafter as reasonably possible), at contractor's sole cost and expense, either by the removal of the encroachment (and subsequent reconstruction on the Project site) or agreement with the adjacent property owner(s) (in form and substance satisfactory to Owner in its sole discretion) allowing the encroachments to remain.

### § 3.3.7 Coordination:

§ 3.3.7.1 In the case of a single prime Contract, the General Contractor becomes the sole responsible party for the coordination of the entire project, and all other prime contractors shall mean subcontractors; In the case of a multiple Prime Contract, the General Contractor shall also be responsible to coordinate the relationships among the Prime Contractors.

§ 3.3.7.2 The General Contractor shall be responsible to coordinate and expedite the total construction process and all of its parts. The Owner relies upon the organization, management, skill, cooperation and efficiency of the General Contractor to supervise, direct, control and manage the work and to coordinate and expedite the efforts of the other prime contractors and subcontractors so as to deliver the work conforming to the contract within the schedules time. The General Contractor is responsible for Proper sequence and coordination. It shall determine the location of work and resolve conflicts amongst Contractors.

§ 3.3.7.3 The General Contractor and all other prime contractors shall provide a qualified full-time staff member or members (i.e.: project managers, superintendent, or foreman) to oversee their own work and the work of their sub-contractors. Should the Prime contractor be responsible for multiple projects at different sites, then such prime contractor shall provide a separate qualified superintendent for each of the projects. In addition, the General Contractor shall provide a qualified full-time superintendent or members to provide mechanical and electrical coordination and perform coordination with all their subcontractors.

§ 3.3.7.4 The Contractor's superintendent and/or foreman will at all times be subject to the approval of the Architect and Construction manager. The Architect and Construction Manager reserves the right to require the contractor to replace the superintendent and/or foreman if, in the opinion of the Architect and Construction Manager, the superintendent and/or foreman is not performing satisfactorily.

§ 3.3.7.5 Each prime contractor shall coordinate his activities with the activities of other contractors.

§ 3.3.7.6 All questions pertaining to the work are to be made to the Architect/Engineer sufficiently in (via an RFI Form) advance of construction to permit comparisons, investigations, or references to drawings and shop drawings as necessary.

§ 3.3.7.7 The General Contractor is required to submit a site logistics plan coordinating all Owner functions with the access and safety of the job site.

§ 3.3.7.8 The Contractor is required to coordinate all the inspection and material testing to meet the contract document specifications.

§ 3.3.7.9 The Contractor has full and sole responsibility for construction methods and implementation of a "quality control system" to insure coordination.

§ 3.3.7.10 The Contractor is responsible for field verification of all dimensions/measurements for the coordination of materials and trades. Check field dimensions, clearances, relationships to available space, and anchors.

§ 3.3.7.11 The Contractor shall make all necessary arrangements to conduct work so that all parts shall be carried harmoniously and simultaneously or sequentially, so as components or increments of the same shall not interfere or retard the progress of others.



§ 3.3.7.12 Minor changes in locations of equipment, parts, etc due to field conditions shall be made, if so directed, at no additional cost.

§ 3.3.7.13 The Contractor shall coordinate the delivery, unloading, movement, relocation, storage and protection of all materials.

§ 3.3.7.14 The Contractor shall examine the drawings and dimensions and is responsible for satisfactory joining and fitting of all parts of the work.

§ 3.3.7.15 Accurate dimensions, sleeved and opening drawings are to submitted prior to placement in the field.

§ 3.3.7.16 Prepare coordination drawings for all above ceiling areas throughout the entire project. Drawings showing all piping, duct, cabletrays, electrical ductbanks, and similar items, but not electrical conduit less than 4 inches in diameter. Complete architectural, mechanical and electrical reflected ceiling layouts, (including ductwork, conduits, piping, lighting, etc.).

§ 3.3.7.17 The Contractor is responsible for any omissions of the subcontractors and is required to provide a complete operating facility.

§ 3.3.7.18 The General Contractor shall be responsible for preserving the integrity of ceiling heights and room sizes.

#### § 3.4 LABOR AND MATERIALS

§ 3.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

§ 3.4.2 Except in the case of minor changes in the Work authorized by the Architect in accordance with Sections 3.12.8 or 7.4, the Contractor may make substitutions only with the consent of the Owner, after evaluation by the Architect and in accordance with a Change Order or Construction Change Directive.

§ 3.4.3 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them.

#### § 3.5 WARRANTY

The Contractor warrants to the Owner and Architect that materials and equipment furnished under the Contract will be of good quality and new unless the Contract Documents require or permit otherwise. The Contractor further warrants that the Work will conform to the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit. Work, materials, or equipment not conforming to these requirements may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. If required by the Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

#### § 3.6 TAXES

The Contractor shall pay sales, consumer, use and similar taxes for the Work provided by the Contractor that are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect.

#### § 3.7 PERMITS, FEES, NOTICES AND COMPLIANCE WITH LAWS

§ 3.7.1 Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit as well as for other permits, fees, licenses, and inspections by government agencies necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded.

§ 3.7.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities applicable to performance of the Work.

§ 3.7.3 If the Contractor performs Work knowing it to be contrary to applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction.

§ 3.7.4 **Concealed or Unknown Conditions.** If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature, that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner and the Architect before conditions are disturbed and in no event later than 21 days after first observance of the conditions. The Architect will promptly investigate such conditions and, if the Architect determines that they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend an equitable adjustment in the Contract Sum or Contract Time, or both. If the Architect determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall promptly notify the Owner and Contractor in writing, stating the reasons. If either party disputes the Architect's determination or recommendation, that party may proceed as provided in Article 15.

§ 3.7.5 If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, archaeological sites or wetlands not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner and Architect. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 15.

## § 3.8 ALLOWANCES

§ 3.8.1 The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct, but the Contractor shall not be required to employ persons or entities to whom the Contractor has reasonable objection.

§ 3.8.2 Unless otherwise provided in the Contract Documents,

- .1 Allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;
- .2 Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowances; and
- .3 Whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Section 3.8.2.1 and (2) changes in Contractor's costs under Section 3.8.2.2.

§ 3.8.3 Materials and equipment under an allowance shall be selected by the Owner with reasonable promptness.

## § 3.9 SUPERINTENDENT

§ 3.9.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during performance of the Work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor.

§ 3.9.2 The Contractor, as soon as practicable after award of the Contract, shall furnish in writing to the Owner through the Architect the name and qualifications of a proposed superintendent. The Architect may reply within 14 days to the Contractor in writing stating (1) whether the Owner or the Architect has reasonable objection to the

proposed superintendent or (2) that the Architect requires additional time to review. Failure of the Architect to reply within the 14 day period shall constitute notice of no reasonable objection.

§ 3.9.3 The Contractor shall not employ a proposed superintendent to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not change the superintendent without the Owner's consent, which shall not unreasonably be withheld or delayed.

#### § 3.10 CONTRACTOR'S CONSTRUCTION SCHEDULES

§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall prepare and submit for the Owner's and Architect's information a Contractor's construction schedule for the Work. The schedule shall not exceed time limits current under the Contract Documents, shall be revised at appropriate intervals as required by the conditions of the Work and Project, shall be related to the entire Project to the extent required by the Contract Documents, and shall provide for expeditious and practicable execution of the Work.

§ 3.10.2 The Contractor shall prepare a submittal schedule, promptly after being awarded the Contract and thereafter as necessary to maintain a current submittal schedule, and shall submit the schedule(s) for the Architect's approval. The Architect's approval shall not unreasonably be delayed or withheld. The submittal schedule shall (1) be coordinated with the Contractor's construction schedule, and (2) allow the Architect reasonable time to review submittals. If the Contractor fails to submit a submittal schedule, the Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of submittals.

§ 3.10.3 The Contractor shall perform the Work in general accordance with the most recent schedules submitted to the Owner and Architect.

#### § 3.11 DOCUMENTS AND SAMPLES AT THE SITE

The Contractor shall maintain at the site for the Owner one copy of the Drawings, Specifications, Addenda, Change Orders and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and one copy of approved Shop Drawings, Product Data, Samples and similar required submittals. These shall be available to the Architect and shall be delivered to the Architect for submittal to the Owner upon completion of the Work as a record of the Work as constructed.

#### § 3.12 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

§ 3.12.1 Shop Drawings are drawings, diagrams, schedules and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier or distributor to illustrate some portion of the Work.

§ 3.12.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

§ 3.12.3 Samples are physical examples that illustrate materials, equipment or workmanship and establish standards by which the Work will be judged.

§ 3.12.4 Shop Drawings, Product Data, Samples and similar submittals are not Contract Documents. Their purpose is to demonstrate the way by which the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals. Review by the Architect is subject to the limitations of Section 4.2.7. Informational submittals upon which the Architect is not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Architect without action.

§ 3.12.5 The Contractor shall review for compliance with the Contract Documents, approve and submit to the Architect Shop Drawings, Product Data, Samples and similar submittals required by the Contract Documents in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of separate contractors.

§ 3.12.6 By submitting Shop Drawings, Product Data, Samples and similar submittals, the Contractor represents to the Owner and Architect that the Contractor has (1) reviewed and approved them, (2) determined and verified

materials, field measurements and field construction criteria related thereto, or will do so and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

§ 3.12.7 The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples or similar submittals until the respective submittal has been approved by the Architect.

§ 3.12.8 The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from requirements of the Contract Documents by the Architect's approval of Shop Drawings, Product Data, Samples or similar submittals unless the Contractor has specifically informed the Architect in writing of such deviation at the time of submittal and (1) the Architect has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples or similar submittals by the Architect's approval thereof.

§ 3.12.9 The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples or similar submittals, to revisions other than those requested by the Architect on previous submittals. In the absence of such written notice, the Architect's approval of a resubmission shall not apply to such revisions.

§ 3.12.10 The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. The Contractor shall not be required to provide professional services in violation of applicable law. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will specify all performance and design criteria that such services must satisfy. The Contractor shall cause such services or certifications to be provided by a properly licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Architect. The Owner and the Architect shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications and approvals performed or provided by such design professionals, provided the Owner and Architect have specified to the Contractor all performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review, approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Contractor shall not be responsible for the adequacy of the performance and design criteria specified in the Contract Documents.

§ 3.12.11 Detailed requirements are specified in the Division 1 section 01300 relating to "Submittals".

§ 3.12.12 All shop drawings are to include manufacturer's data. All shop drawings and samples are to be submitted by the Contractor to the Architect for review. Each sheet of the shop drawings shall identify the project, contractor, subcontractor, and fabricator or manufacturer and the date of the drawings. All shop drawings shall be numbered in consecutive sequence and each sheet shall indicate the total number of sheets in the set.

§ 3.12.13 Substitutions: All substitutions or deviations from plans and specifications must be clearly noted as such on all shop drawings. Contractor shall identify, coordinate and pay for any additional requirements as a result of substitutions, deviations, etc. including necessary change orders. In addition, substitution submittals shall be made no later than 30 days after Notice to Proceed in order to provide time for comparison review.

### § 3.13 USE OF SITE

The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities and the Contract Documents and shall not unreasonably encumber the site with materials or equipment.

§ 3.13.1 Location and weights of all equipment and materials that the Contractor intends to place on the slab shall be submitted to the Architect for review.

§ 3.13.2 Only materials and equipment which are to be used directly in the Work shall be brought to and stored on the Project site by the Contractor. After equipment is no longer required for the Work, it shall be promptly removed from the Project site. Protection of construction materials and equipment stored at the Project site from weather, theft, damage and all other adversity is solely the responsibility of the Contractor.

§ 3.13.3 The contractor and any entity for whom the Contractor is responsible shall not erect any sign on the Project site without the prior written consent of the Owner.

§ 3.13.4 Contractor shall ensure that the Work, at all times, is performed in a manner that affords reasonable access, both vehicular and pedestrian, to the site of the Work and all adjacent areas. The Work shall be performed, to the fullest extent reasonably possible, in such a manner that public areas adjacent to the site of the Work shall free from all debris, building materials and equipment likely to cause hazardous conditions. Without limitation of any provision of the Contract Documents, Contractor shall use its best efforts to minimize any interference with the occupancy or beneficial use of (1) any areas and buildings adjacent to the site of the Work or (2) the Building in the event of partial occupancy, as more specifically described in Paragraph 9.9.

§ 3.13.5 Without prior approval of the Owner, the Contractor shall not permit any workers to use any existing facilities at the Project site, including without limitation, lavatories, toilets, entrances and parking areas other than those designated by the Owner. Without limitation of any other provision of the Contract Documents, the Contractor shall use its best efforts to comply with all rules and regulations promulgated by the Owner in connection with the use and occupancy of the Project site and the Building, as amended from time to time.

§ 3.13.6 The Contractor shall immediately notify the Owner in writing if during the performance of the Work, the Contractor finds compliance with any portion of such rules and regulations to be impracticable, setting forth the problems of such and suggest alternatives through which the same results can be achieved. The Owner may, in the Owner's sole discretion, adopt such suggestions, develop new alternatives or require compliance with the existing requirements and collective bargaining agreements applicable to use and occupancy of the Project site and the Building

§ 3.13.7 The General Contractor shall provide a temporary construction fence whether shown on the Contract Documents or not as required to separate the area or areas under construction from the Owners area or areas used by the public. The temporary fencing shall be approved by the Owner prior to installation.

#### § 3.14 CUTTING AND PATCHING

§ 3.14.1 The Contractor shall be responsible for cutting, fitting or patching required to complete the Work or to make its parts fit together properly. All areas requiring cutting, fitting and patching shall be restored to the condition existing prior to the cutting, fitting and patching, unless otherwise required by the Contract Documents.

§ 3.14.2 The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner or separate contractors by cutting, patching or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter such construction by the Owner or a separate contractor except with written consent of the Owner and of such separate contractor; such consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold from the Owner or a separate contractor the Contractor's consent to cutting or otherwise altering the Work.

#### § 3.15 CLEANING UP

§ 3.15.1 The Contractor shall keep the premises and surrounding area free from accumulation of waste materials or rubbish caused by operations under the Contract. At completion of the Work, the Contractor shall remove waste materials, rubbish, the Contractor's tools, construction equipment, machinery and surplus materials from and about the Project.

§ 3.15.2 If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and Owner shall be entitled to reimbursement from the Contractor.



§ 3.15.3 Each Prime Contractor shall perform all daily clean up and removal of debris from the site including that of his subcontractors. Each Prime Contractor shall maintain an adequate supply of laborers to accomplish daily clean up and removal of debris from the site and work areas. No debris will be allowed to accumulate in or around the building including masonry debris. This building site must be maintained free of all litter and debris on a daily basis. No accumulation of flammable material is permitted. Prior to installation of finishes the floors will be swept and kept free of dust and dirt until turned over to the owner.

§ 3.15.4 Cleaning and debris removal may be considered a safety concern by judgment of the Owner or his agents and as such the work may be stopped to provide time and labor for immediate clean up.

§ 3.15.5 Final Clean-Up: The General Construction Contractor has the responsibility for the final clean-up and policing of the entire site after other contractors have removed their own waste materials, rubbish, equipment, tools and plant. In addition thereto, the General Construction Contractor shall have a professional cleaning company perform the following immediately prior to the Architect's inspection for Substantial Completion:

§ 3.15.5.1 Removal of all manufacturer's temporary labels from materials, equipment and fixtures.

§ 3.15.5.2 Removal of all stains from glass and mirrors; wash, polish, inside and outside.

§ 3.15.5.3 Removal of marks, stains, finger prints, other soil, dust, dirt, from painted, decorated, or stained woodwork, plaster or plasterboard, metal, acoustic tile, and equipment surfaces.

§ 3.15.5.4 Remove spots, paint, soil, from resilient flooring.

§ 3.15.5.5 Remove temporary floor protections; clean, strip and provide three (3) coats of wax on new VCT floors or otherwise treat as directed by the material manufacturer's recommendation, all finished floors. Final vacuum all carpet.

§ 3.15.5.6 Clean all interior finished surfaces, including doors and window frames, and hardware required to have a polished finish, of oil, stains, dust, dirt, paint, and the like; leave without finger prints, blemishes.

§ 3.15.5.7 Final site clean-up shall extend beyond the Contract Limit Lines as reasonably required to insure the complete removal of all construction debris from the entire site, including staging areas.

## § 3.16 ACCESS TO WORK

The Contractor shall provide the Owner and Architect access to the Work in preparation and progress wherever located.

§ 3.16.1 The Contractor shall promptly notify the Architect/Engineer and Owner of the presence of hazardous conditions at the site, including the start of hazardous operations or the discovery or exposure of hazardous substances.

§ 3.16.2 Contractor shall be responsible for snow plowing and snow removal as required to maintain access/egress to construction area.

§ 3.16.3 Contractor shall keep only necessary equipment on site and shall cooperate with the Owner regarding location of stored material.

## § 3.17 ROYALTIES, PATENTS AND COPYRIGHTS

The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner and Architect harmless from loss on account thereof, but shall not be responsible for such defense or loss when a particular design, process or product of a particular manufacturer or manufacturers is required by the Contract Documents, or where the copyright violations are contained in Drawings, Specifications or other documents prepared by the Owner or Architect. However, if the Contractor has reason to believe that the required design, process or product is an infringement of a copyright or a patent, the Contractor shall be responsible for such loss unless such information is promptly furnished to the Architect.

## § 3.18 INDEMNIFICATION

§ 3.18.1 To the fullest extent permitted by law the Contractor shall indemnify and hold harmless the Owner, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work, provided that such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), but only to the extent caused by the negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity that would otherwise exist as to a party or person described in this Section 3.18.

§ 3.18.1.1 Contractor for itself, its successors and assigns, agrees to indemnify and save Owner, its successors, assigns, employees, agents, architects and engineers, harmless from, and against any and all claims, demands, damages, actions or causes of action, together with any and all losses, costs or expenses in connection therewith or related thereto, including but not limited to attorney fees for costs of suit, for bodily injuries, death or property damage arising in or in any manner growing out of the work performed, or to be performed under this Contract whether or not caused by fault or negligence of Owner. Contractor, for itself, its successors and assigns, hereby expressly agrees to waive any provision of the applicable State's Workers' Compensation Act, including Section 303(b), whereby the contractor could preclude its joinder as an additional defendant or avoid liability for damages, Contribution or Indemnity in any action at law, or otherwise where Contractor's employee or employees, heirs, assigns or anyone otherwise entitled to receive damages by reason of injury or death brings an action at law against the Owner, its successors, assigns employees, agents, engineers or architects, Contractor, of itself, its successors and assign, agrees to indemnify the Owner, its successors, assigns, employees, agents, architects, Construction Manager and engineers against all fines, penalties or losses incurred for, including but not limited to attorney fees and costs of suit, or by reason of the violation by Contractor in the performance of this Contract, of any ordinance, regulation, rule of law of any political subdivision or duly constituted public authority. Without limiting the foregoing, the Contractor, at the request of Owner, its successors, assigns, employees, agents, architect, Construction Manager or engineers, agrees to defend at the Contractor's expense any suit or proceeding brought against Owner, its successors, assigns, employees, agents, architect, Construction Manager or engineers, due to, or arising out of the work performed by the Contractor.

§ 3.18.2 In claims against any person or entity indemnified under this Section 3.18 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, the indemnification obligation under Section 3.18.1 shall not be limited by a limitation on amount or type of damages, compensation or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts or other employee benefit acts.

## ARTICLE 4 ARCHITECT

### § 4.1 GENERAL

§ 4.1.1 The Owner shall retain an architect lawfully licensed to practice architecture or an entity lawfully practicing architecture in the jurisdiction where the Project is located. That person or entity is identified as the Architect in the Agreement and is referred to throughout the Contract Documents as if singular in number.

§ 4.1.2 Duties, responsibilities and limitations of authority of the Architect as set forth in the Contract Documents shall not be restricted, modified or extended without written consent of the Owner, Contractor and Architect. Consent shall not be unreasonably withheld.

§ 4.1.3 If the employment of the Architect is terminated, the Owner shall employ a successor architect as to whom the Contractor has no reasonable objection and whose status under the Contract Documents shall be that of the Architect.

### § 4.2 ADMINISTRATION OF THE CONTRACT

§ 4.2.1 The Architect will provide administration of the Contract as described in the Contract Documents and will be an Owner's representative during construction until the date the Architect issues the final Certificate for Payment.

The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

§ 4.2.2 The Architect will visit the site at intervals appropriate to the stage of construction, or as otherwise agreed with the Owner, to become generally familiar with the progress and quality of the portion of the Work completed, and to determine in general if the Work observed is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. However, the Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Architect will not have control over, charge of, or responsibility for, the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents, except as provided in Section 3.3.1.

§ 4.2.3 On the basis of the site visits, the Architect will keep the Owner reasonably informed about the progress and quality of the portion of the Work completed, and report to the Owner (1) known deviations from the Contract Documents and from the most recent construction schedule submitted by the Contractor, and (2) defects and deficiencies observed in the Work. The Architect will not be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. The Architect will not have control over or charge of and will not be responsible for acts or omissions of the Contractor, Subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work.

#### § 4.2.4 COMMUNICATIONS FACILITATING CONTRACT ADMINISTRATION

Except as otherwise provided in the Contract Documents or when direct communications have been specially authorized, the Owner and Contractor shall endeavor to communicate with each other through the Architect about matters arising out of or relating to the Contract. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors and material suppliers shall be through the Contractor. Communications by and with separate contractors shall be through the Owner.

§ 4.2.5 Based on the Architect's evaluations of the Contractor's Applications for Payment, the Architect will review and certify the amounts due the Contractor and will issue Certificates for Payment in such amounts.

§ 4.2.6 The Architect has authority to reject Work that does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable, the Architect will have authority to require inspection or testing of the Work in accordance with Sections 13.5.2 and 13.5.3, whether or not such Work is fabricated, installed or completed. However, neither this authority of the Architect nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect to the Contractor, Subcontractors, material and equipment suppliers, their agents or employees, or other persons or entities performing portions of the Work.

§ 4.2.7 The Architect will review and approve, or take other appropriate action upon, the Contractor's submittals such as Shop Drawings, Product Data and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect's action will be taken in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Architect's professional judgment to permit adequate review. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5 and 3.12. The Architect's review shall not constitute approval of safety precautions or, unless otherwise specifically stated by the Architect, of any construction means, methods, techniques, sequences or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

§ 4.2.8 The Architect will prepare Change Orders and Construction Change Directives, and may authorize minor changes in the Work as provided in Section 7.4. The Architect will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4.



§ 4.2.9 The Architect will conduct inspections to determine the date or dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion pursuant to Section 9.8; receive and forward to the Owner, for the Owner's review and records, written warranties and related documents required by the Contract and assembled by the Contractor pursuant to Section 9.10; and issue a final Certificate for Payment pursuant to Section 9.10.

*(Paragraph deleted)*

§ 4.2.11 The Architect will interpret and decide matters concerning performance under, and requirements of, the Contract Documents on written request of either the Owner or Contractor. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness.

§ 4.2.12 Interpretations and decisions of the Architect will be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of drawings.

§ 4.2.13 The Architect's decisions on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents.

§ 4.2.14 The Architect will review and respond to requests for information about the Contract Documents. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

## ARTICLE 5 SUBCONTRACTORS

### § 5.1 DEFINITIONS

§ 5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include a separate contractor or subcontractors of a separate contractor.

§ 5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site. The term "Sub-subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

### § 5.2 AWARD OF SUBCONTRACTS AND OTHER CONTRACTS FOR PORTIONS OF THE WORK

§ 5.2.1 Unless otherwise stated in the Contract Documents or the bidding requirements, the Contractor, as soon as practicable after award of the Contract, shall furnish in writing to the Owner through the Architect the names of persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for each principal portion of the Work. The Architect may reply within 14 days to the Contractor in writing stating (1) whether the Owner or the Architect has reasonable objection to any such proposed person or entity or (2) that the Architect requires additional time for review. Failure of the Owner or Architect to reply within the 14-day period shall constitute notice of no reasonable objection.

§ 5.2.2 The Contractor shall not contract with a proposed person or entity to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.

§ 5.2.3 If the Owner or Architect has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or Architect has no reasonable objection.

§ 5.2.4 The Contractor shall not substitute a Subcontractor, person or entity previously selected if the Owner or Architect makes reasonable objection to such substitution.

### § 5.3 SUBCONTRACTUAL RELATIONS

By appropriate agreement, written where legally required for validity, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by

terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor's Work, which the Contractor, by these Documents, assumes toward the Owner and Architect. Each subcontract agreement shall preserve and protect the rights of the Owner and Architect under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement that may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

*(Paragraphs deleted)*

§ 5.3.1 The Contractor shall obligate each subcontractor specifically to comply with the New Jersey Plan of Affirmative Action to avoid discriminatory practice in employment.

§ 5.3.2 The Contractor shall obligate each subcontractor to comply with the applicable prevailing wage schedule of the Department of Labor of the State of New Jersey.

§ 5.3.3 The Contractor shall obligate each Subcontractor to comply with the Public Works Contractor Registration Act of the State of New Jersey.

## ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

### § 6.1 OWNER'S RIGHT TO PERFORM CONSTRUCTION AND TO AWARD SEPARATE CONTRACTS

§ 6.1.1 The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and to award separate contracts in connection with other portions of the Project or other construction or operations on the site under Conditions of the Contract identical or substantially similar to these including those portions related to insurance and waiver of subrogation. If the Contractor claims that delay or additional cost is involved because of such action by the Owner, the Contractor shall make such Claim as provided in Article 15.

§ 6.1.2 When separate contracts are awarded for different portions of the Project or other construction or operations on the site, the term "Contractor" in the Contract Documents in each case shall mean the Contractor who executes each separate Owner-Contractor Agreement.

§ 6.1.3 THE CONTRACTOR SHALL BE RESPONSIBLE TO COORDINATE ALL WORK. All trades have a mutual obligation to coordinate their work with the other trades and cooperate as necessary with the Contractor, Construction Manager if applicable, and the Construction schedule – to complete the work as required by the Owner. The Construction Manager if applicable will provide assistance to the Contractor for coordination between their work and the Owner. The Contractor is required to have their superintendent or foreman on site at all times when their work or that of their subcontractors is in progress.

§ 6.1.4 Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the Project with the Owner's own forces, the Owner shall be deemed to be subject to the same obligations and to have the same rights that apply to the Contractor under the Conditions of the Contract, including, without excluding others, those stated in Article 3, this Article 6 and Articles 10, 11 and 12.

## § 6.2 MUTUAL RESPONSIBILITY

§ 6.2.1 The Contractor shall afford the Owner and separate contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents.

§ 6.2.2 If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner or a separate contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly report to the Architect apparent discrepancies or defects in such other construction that would render it unsuitable for such proper execution and results. Failure of the Contractor so to report shall constitute an acknowledgment that the Owner's or separate contractor's completed or partially completed construction is fit and proper to receive the Contractor's Work, *should the Contractor be damaged by any other separate Contractor on the work by reason of such other Contractor's failure to perform properly his Contract with the Owner, no action will lie against the Owner and the Owner shall have no liability therefore, but the Contractor may assert his claim for damage against such separate Contractor as a third party beneficiary under the Contract between such other Contractor and the Owner.*

§ 6.2.3 The Contractor shall reimburse the Owner for costs the Owner incurs that are payable to a separate contractor because of the Contractor's delays, improperly timed activities or defective construction.

§ 6.2.4 The Contractor shall promptly remedy damage the Contractor causes to completed or partially completed construction or to property of the Owner or separate contractors as provided in Section 10.2.5, *should the Contractor be damaged by any other separate Contractor on the work by reason of such other Contractor's failure to perform properly his Contract with the Owner, no action will lie against the Owner and the Owner shall have no liability therefore, but the Contractor may assert his claim for damage against such separate Contractor as a third party beneficiary under the Contract between such other Contractor and the Owner..*

§ 6.2.5 The Owner and each separate contractor shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14.

## § 6.3 OWNER'S RIGHT TO CLEAN UP

If a dispute arises among the Contractor, separate contractors and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and the Architect will allocate the cost among those responsible as the Owner determines to be just, based on the recommendation of the Architect.

## ARTICLE 7 CHANGES IN THE WORK

### § 7.1 GENERAL

§ 7.1.1 Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents.

§ 7.1.1.1 A field directive or field order shall not be recognized as having any impact upon the Contract Sum or the Contract Time and the Contractor shall have no claim therefor unless it shall, prior to complying with same and in no event no later than 10 working days from the date such direction or order was given, submit to the Owner for the Owner's approval its change proposal.

§ 7.1.2 A Change Order shall be based upon agreement among the Owner, Contractor and Architect; a Construction Change Directive requires agreement by the Owner and Architect and may or may not be agreed to by the Contractor; an order for a minor change in the Work may be issued by the Architect alone in accordance with Section 7.4.1.

§ 7.1.2.1 **"Neither this Contract nor the Work to be performed hereunder can be changed by oral agreement. No course of conduct or dealings between the parties, nor express or implied acceptance of alterations or additions to the Work and no claims that the Owner has been unjustly enriched by any alteration or addition to the Work, whether there is, in fact, any unjust enrichment to the Work, shall be the basis for any alleged implied agreement by the Owner to the change, any alleged waiver of the Owner's rights under this Contract**

or any increase in any amounts due under the Contract or any or a change in any time period provided for in the Contract Documents."

§ 7.1.3 Changes in the Work shall be performed under applicable provisions of the Contract Documents, and the Contractor shall proceed promptly, unless otherwise provided in the Change Order, Construction Change Directive or order for a minor change in the Work.

§ 7.1.4 A directive or order from the Owner or the Architect, other than a Change Order, a Construction Change Directive or any Order for a minor change pursuant to this Article 7, shall not be recognized as having any impact on the Contract Sum or the Contract Time and the Contractor shall have no claim therefore. If the Contractor believes that a directive or order would require it to perform work not required by the Contract Documents, the Contractor shall so inform the Owner and Architect in writing prior to complying with the same and in no event any later than five (5) working days from the day such direction or order was given, and shall submit to the Owner and Architect for the Owner's and Architect's approval its change proposal.

## § 7.2 CHANGE ORDERS

§ 7.2.1 A Change Order is a written instrument prepared by the Architect and signed by the Owner, Contractor and Architect stating their agreement upon all of the following:

- .1 The change in the Work;
- .2 The amount of the adjustment, if any, in the Contract Sum; and
- .3 The extent of the adjustment, if any, in the Contract Time.

§ 7.2.2 Any change in work authorized in writing by the Owner and Architect that will require a change in the cost of the work, whether an additive or deductive change in cost, shall show a complete cost breakdown of labor, material, equipment and insurance, and appropriate overhead and profit in accordance with 7.3.6 and 7.3.6.1.

§ 7.2.3 When a Change Order involves both additions and deletions in material, the net quantity is to be determined and the overhead and profit is to be applied to the net quantity in accordance with 7.3.6 and 7.3.6.1.

§ 7.2.4 When a Change Order involves deletions in materials and labor, the amount of the credit will be equal to the line item on the Schedule of Values or a unit of the value if only a portion of the value is being deleted.

§ 7.2.5 When any change in the Work, regardless of the reason therefore, requires or is alleged to require an adjustment in Contract Time, such request for time adjustment shall be submitted by the Contractor as part of the change proposal. Any Change Order approved by the Owner and for which payment is accepted by the Contractor, in which no adjustment in Contract Time is stipulated, shall be understood to mean that no such adjustment is required by reason of the change, and any and all rights of the Contractor or any subsequent request of adjustment of Contract Time by reason of the change is waived.

§ 7.2.6 Request by the Contractor for adjustment of the Contract Amount regardless of the reason therefore, shall be submitted to the Architect and the Owner with itemized labor and material quantities and unit prices to permit proper evaluation of the request. A submission by the Contractor containing unsubstantiated lump sum requests for adjustment of the Contract Amount will not be considered by the Owner and Architect. The Owner and Architect will not be liable for any delay incurred by reason of the Contractor's failure to submit satisfactory justification and back-up with any request for adjustment to the Contract Amount.

§ 7.2.7 Agreement on any Change Order shall constitute a final settlement of all matters relating to the change in the initial Work which is the subject of the Change Order, including, but not limited to, all direct or indirect costs associated with such change and any and all adjustment to the Contract Sum and the Construction Schedule. The contractor will not be entitled to any compensation for additional work or delays in the Construction Schedule not included in the Change Order

## § 7.3 CONSTRUCTION CHANGE DIRECTIVES

§ 7.3.1 A Construction Change Directive is a written order prepared by the Architect and signed by the Owner and Architect, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes

in the Work within the general scope of the Contract consisting of additions, deletions or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

§ 7.3.2 A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order.

§ 7.3.3 If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:

- .1 a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation as prepared by the Architect;
- .2 Unit prices stated in the Contract Documents or subsequently agreed upon;
- .3 Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or
- .4 As provided in Section 7.3.7.

§ 7.3.4 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed in a proposed Change Order or Construction Change Directive so that application of such unit prices to quantities of Work proposed will cause substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

§ 7.3.5 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Architect of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

§ 7.3.6 A Construction Change Directive signed by the Contractor indicates the Contractor's agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

§ 7.3.7 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Architect shall determine the method and the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an allowance for overhead in accordance with the schedule set forth in Subparagraph 7.3.7.1 below, or if no such amount is set forth, a reasonable amount. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the Architect may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.7 shall be limited to the following:

- .1 Costs of labor, including social security, old age and unemployment insurance, fringe benefits required by agreement or custom, and workers' compensation insurance;
- .2 Costs of materials, supplies and equipment, whether incorporated or consumed;
- .3 Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;

§ 7.3.7.1 In Subparagraph 7.3.7 the allowance for overhead and profit combined, included in the total cost to the Owner, shall be based upon the following schedule and may only include a Contractor, his Subcontractor and his sub-subcontractor:

7.3.7.1.1 For the Contractor, for any work performed by the Contractor's own forces, 15% of the cost.

7.3.7.1.2 For the Contractor, for any work performed by his Subcontractor, 5% of the amount due the Subcontractor.

7.3.7.1.3 For each Subcontractor or Sub-subcontractor involved, for any Work performed by that contractor's own forces, 10% of the cost.



7.3.7.1.4 For each Subcontractor, for any Work performed by his Sub-subcontractor 10% of the amount due the Subcontractor.

7.3.7.1.5 Cost to which overhead and profit is to be applied shall be determined in accordance with Subparagraph 7.3.7.

7.3.7.1.6 In order to facilitate checking of quotations for extras or credits, all proposals, except those so minor that their propriety can be seen by inspection, shall be accompanied by a complete itemization of costs, including labor, materials and subcontracts. Labor and materials shall be itemized in the manner prescribed above. Where major cost items are subcontractors, they shall be itemized also. In no case will a change involving over \$200.00 be approved without such itemization.

§ 7.3.8 The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Architect. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

§ 7.3.9 Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment. The Architect will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the amount that the Architect determines, in the Architect's professional judgment, to be reasonably justified. The Architect's interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a Claim in accordance with Article 15.

§ 7.3.10 When the Owner and Contractor agree with a determination made by the Architect concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and the Architect will prepare a Change Order. Change Orders may be issued for all or any part of a Construction Change Directive.

#### § 7.4 MINOR CHANGES IN THE WORK

The Architect has authority to order minor changes in the Work not involving adjustment in the Contract Sum or extension of the Contract Time and not inconsistent with the intent of the Contract Documents. Such changes will be effected by written order signed by the Architect and shall be binding on the Owner and Contractor.

### ARTICLE 8 TIME

#### § 8.1 DEFINITIONS

§ 8.1.1 Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work.

*(Paragraph deleted)*

§ 8.1.2.1 The work to be performed under this Contract shall commence after the required insurance has been obtained and approved and within three days after issuance of the Notice to Proceed by the Owner. The Contract Time shall commence as of the date of the Notice to Proceed unless otherwise specified in the agreement.

§ 8.1.3 The date of Substantial Completion is the date certified by the Architect in accordance with Section 9.8.

§ 8.1.4 The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

#### § 8.2 PROGRESS AND COMPLETION

§ 8.2.1 Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement the Contractor confirms that the Contract Time is a reasonable period for performing the Work.

§ 8.2.2 The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, prematurely commence operations on the site or elsewhere prior to the effective date of insurance required by Article II to be furnished by the Contractor and Owner. The date of commencement of the Work shall not be changed by the effective date of such insurance.

§ 8.2.3 The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

§ 8.2.4 Owner, or his representative, in coordination with the Contractor, shall set work hours. Contractor may be required to work nights, weekends or holidays as necessary to complete the work in accordance with the Schedule or in coordination with the Owner's activities. Under no circumstances shall the Contractor begin or continue with work that is adversely impacting activities or operations. All utility shutdowns, interruptions, work in or adjacent to existing buildings will be coordinated through the Owner. Or his representative, and may have to be performed during hours when the Owner's activities are not in operation. All cutting, hammering or other activity that is noisy, produces smoke or fumes or is otherwise disruptive to the Owner's operations may have to be done during hours when the Owner's activities are not in operation. Work required to be performed during non-operating hours, as determined by the Owner or his representative, will be performed at no additional cost to the Owner.

### § 8.3 DELAYS AND EXTENSIONS OF TIME

§ 8.3.1 If the Contractor is delayed at any time in the commencement or progress of the Work by an act or neglect of the Owner or Architect, or of an employee of either, or of a separate contractor employed by the Owner; or by changes ordered in the Work; or by occurrences beyond the control and without the fault or negligence of the Contractor and which by the exercise of reasonable diligence the Contractor is unable to prevent or provide against, including labor disputes (other than disputes limited to the work force of, or provided by, the Contractor or its Subcontractors), fire, unusual delay in deliveries not reasonably anticipatable, unavoidable casualties, or by other occurrences which the Architect, subject to the Owner's approval, determines may justify delay, then, provided that the Contractor is in compliance with Subparagraph 4.3.3 hereof, the Contract Time shall be extended by Change Order or Construction Change Directive for the length of time actually and directly caused by such occurrence as determined by the Architect and approved by the Contractor and Owner (such approval not to be unreasonably withheld, delayed or conditioned); provided, however, that such extension of Contract Time shall be net of any delays caused by or due to the fault or negligence of the Contractor or which are otherwise the responsibility of the Contractor and shall also be net of any contingency or "float" time allowance included in the Contractor's construction Schedule. The Contractor shall, in the event of any occurrence likely to cause a delay, cooperate in good faith with the Architect and Owner to minimize and mitigate the impact of any such occurrence and do all things reasonable under the circumstances to achieve this goal.

*(Paragraph deleted)*

§ 8.3.2.1 Any claim for extension of time should be made in writing to the Architect not more than five (5) days after the commencement of the delay, otherwise, it should be waived. The Contractor shall provide an estimate of the possible effect of such delay on the progress of the work. No claim made beyond the five (5) days shall be valid.

§ 8.3.2.2 The Contractor agrees that if any delay in the Contractor's works unnecessarily delays the work of any other Contractor or Contractors, the Contractor shall in that case pay all costs and expenses incurred by such parties due to such delays and hereby authorizes the Owner to deduct the amount of such costs and expenses from any moneys due or to become due the Contractor under this Contract. The Architect shall be responsible for ascertaining whether the Contractor is responsible for delaying any of the work of any other Contractor. His decision shall be final.

§ 8.3.2.3 Notwithstanding anything to the contrary in the Contract Documents, any extension of the Contract Time, to the extent permitted under Paragraph 8.3.1, shall be the sole remedy of the Contractor for any (1) delay in the commencement, prosecution or completion of the Work, (2) hindrance or obstruction in the performance of the Work, (3) loss of productivity or (4) other similar claims (collectively referred to in this Paragraph 8.3.2.3 as "delays"), whether or not such delays are foreseeable, unless a delay is caused by acts of the Owner constituting active interference with the Contractor's performance of the Work and only to the extent such acts continue after the Contractor furnishes the Owner with written notice of such interference. In no event shall the Contractor be entitled to any compensation or recovery of any damages in connection with any delay including without limitation consequential damages, lost opportunity cost, impact damages or other similar remuneration. The Owner's exercise of any of its rights or remedies under the Contract Documents (including without limitation ordering changes in the Work or directing suspension, rescheduling or correction of the Work) regardless of the extent or frequency of the

Owner's exercise of such rights or remedies shall not be construed as an act interference with the Contractor's performance of the Work.

§ 8.3.2.4 The Contractor agrees that the Owner can deduct from the Contract Sum, any wages paid by the Owner to any Inspector or Architect or other professional necessarily employed by the Owner for any number of days in excess of the number of days allowed in the specifications for completion of work.

§ 8.3.2.5 Where the cause of delay is due to weather conditions, extension of time shall be granted only for unusually severe weather, as determined by reference to historical data. The term "historical data" as used in the previous sentence shall be construed according to this formula: Average rainfall (or snow or low temperature) for the past five years.

§ 8.3.3 This Section 8.3 does not preclude recovery of damages for delay by either party under other provisions of the Contract Documents.

## ARTICLE 9 PAYMENTS AND COMPLETION

### § 9.1 CONTRACT SUM

The Contract Sum is stated in the Agreement and, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents.

#### § 9.1.1 Payment Procedures shall be as follows:

9.1.1.1 Contractor shall submit Schedule of Values to Construction Manager and Architect for review

9.1.1.2 Prior to end of each pay period, Contractor shall submit a rough draft ("pencil copy ") for their payment application for review and approval by the Architect and the Construction Manager.

9.1.1.3 Upon approval of pencil copy, Contractor shall submit at least five copies of their payment application to the Architect for approval along with their certified payrolls and monthly manning reports.

9.1.1.4 Architect and Construction Manager will approve payments and forward to the Owner.

### § 9.2 SCHEDULE OF VALUES

§ 9.2.1 Before the first Application for Payment, the Contractor shall submit to the Architect a schedule of values allocated to various portions of the Work, which in the aggregate equals that total Contract Sum, divided so as to facilitate payments to Subcontractors, supported by such evidence of correctness as the Architect may direct or as required by the Owner. These schedules, when approved by the Architect, Construction Manager (if applicable) and Owner, shall be used to monitor the progress of the Work and as a basis for Certificates for Payment. All items with entered values will be transferred by the Contractor to the "Applications and Certificate for Payment", and shall include the latest approved Change Orders and Construction Change Directives. Change Order values and Construction Change Directive values shall be broken down to show the various subcontracts. The Application for Payment shall be on AIA Document G702 and G703 and the approved Voucher obtainable from the Owner. Each Item shall show its total scheduled value, value of previous applications, value of the application, percentage completed, value completed and value yet to be completed. All blanks and columns must be filled in, including every percentage complete figure.

### § 9.3 APPLICATIONS FOR PAYMENT

The Contractor shall submit to the Architect an itemized Application for Payment for their Contract on AIA Document G702 and G703 and the approved Voucher obtainable from the Owner. Payroll Certification for all employees of all of the workers on the project shall be submitted as well as other such data for the purposes of summarizing the work and tracking the project. The architect and Construction Manager (if applicable) will process the application and forward it with his recommendations to the Owner.

*(Paragraphs deleted)*

§ 9.3.1.2 Applications for Payment shall not include requests for payment for portions of the Work for which the Contractor does not intend to pay a Subcontractor or material supplier, unless such Work has been performed by others whom the Contractor intends to pay.



§ 9.3.1.3 Until substantial completion, the Owner will pay 98% of the amount due the Contractor on account of progress payments. The retainage will be held until final acceptance of the project by the Architect and the Owner. The Contractor shall submit a separate voucher for the full amount of the retainage along with the Consent of Surety, AIA Form G707A and the Contractor shall be required to furnish a Maintenance Bond for 100% of the Project Cost for a period of two (2) years from the Date of Final Acceptance.

§ 9.3.1.4 Upon acceptance of the Work performed pursuant to this Contract for which the Contractor has agreed to the withholding of payments pursuant to Article 9 of this Contract, all amounts being withheld by the Owner shall be paid in accordance with Paragraph 9.3.1.3 without further withholding of any amounts for any purposes whatsoever, provided that the Contract has been satisfactorily completed.

§ 9.3.1.5 Each application for payment shall be accompanied by the following, all in form and substance satisfactory to the Owner and Architect:

§ 9.3.1.5.1 A current contractor's lien waiver and duly executed and acknowledged sworn statement by an officer of the Contractor showing all subcontractors and materialmen with whom the Contractor has entered into subcontracts, the amount of each such subcontract, the amount requested for any subcontractor and materialmen in the requested progress payment and the amount to be paid to the Contractor from such progress payment together with similar sworn statements from all such subcontractors and materialmen

§ 9.3.1.5.2 Duly executed waivers of mechanic's and materialmen's liens from all subcontractors and when appropriate, from materialmen and lower tier subcontractors establishing payment or satisfaction of payment of all amounts requested by the Contractor on behalf of such entities or persons in any previous application for payment; and

§ 9.3.1.5.3 All information and materials required to comply with the requirements of the Contract Documents or reasonably requested by the Owner or the Architect.

§ 9.3.2 At the Owner's option, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with paragraphs 9.3.2.1, 9.3.2.2, 9.3.2.3, and 9.3.2.4 satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest, and shall include the costs of applicable insurance, storage and transportation to the site for such materials and equipment stored off the site.

§ 9.3.2.1 With each Application for Payment the Contractor shall submit to the Architect and Owner a written list identifying each location where materials are stored off the Project site and the value of materials at each location. The Contractor shall procure insurance satisfactory to the Owner for materials stored off the Project site in an amount not less than the total value thereof.

§ 9.3.2.2 The consent of any surety shall be obtained to the extent required prior to the payment for any materials stored off the Project site.

§ 9.3.2.3 Representatives of the Owner shall have the right to make inspections of the off site storage areas at any time.

§ 9.3.2.4 Materials stored off site shall be protected from diversion, destruction, theft and damage to the satisfaction of the Owner, shall specifically be marked for use on the Project and shall be segregated from other materials at the storage facility.

§ 9.3.3 The Contractor warrants and agrees that title to all Work will pass to the Owner either by incorporation in the construction or upon receipt of payment therefor by the Contractor, whichever occurs first, free and clear of all liens, claims, security interests, or encumbrances whatsoever, that the vesting of such title shall not impose any obligation on Owner or relieve Contractor of any of its obligations under the Contract, that the Contractor shall remain responsible for damages to or loss of the Work, whether completed or under construction, until responsibility for the Work has been accepted by Owner in the manner set forth in the Contract Documents, and that no Work

covered by an Application for Payment will have been acquired by the Contractor, or by any other person performing Work at the site or furnishing materials and equipment for the Project, subject to an agreement under which an interest therein or an encumbrance thereon is retained by the seller or otherwise imposed by the Contractor or such other person.

#### § 9.4 CERTIFICATES FOR PAYMENT

§ 9.4.1 The Architect will, within seven days after receipt of the Contractor's Application for Payment, either issue to the Owner a Certificate for Payment, with a copy to the Contractor, for such amount as the Architect determines is properly due, or notify the Contractor and Owner in writing of the Architect's reasons for withholding certification in whole or in part as provided in Section 9.5.1.

§ 9.4.1.1 The Owner will issue payment to the Contractor pursuant to the Owner's administrative policy at the time that a duly approved Payment Certificate is presented.

§ 9.4.2 The issuance of a Certificate for Payment will constitute a representation by the Architect to the Owner, based on the Architect's evaluation of the Work and the data comprising the Application for Payment, that, to the best of the Architect's knowledge, information and belief, the Work has progressed to the point indicated and that the quality of the Work is in accordance with the Contract Documents. The foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion and to specific qualifications expressed by the Architect. The issuance of a Certificate for Payment will further constitute a representation that the Contractor is entitled to payment in the amount certified. However, the issuance of a Certificate for Payment will not be a representation that the Architect has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work, (2) reviewed construction means, methods, techniques, sequences or procedures, (3) reviewed copies of requisitions received from Subcontractors and material suppliers and other data requested by the Owner to substantiate the Contractor's right to payment, or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

#### § 9.5 DECISIONS TO WITHHOLD CERTIFICATION

§ 9.5.1 The Architect may withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Architect's opinion the representations to the Owner required by Section 9.4.2 cannot be made. If the Architect is unable to certify payment in the amount of the Application, the Architect will notify the Contractor and Owner as provided in Section 9.4.1. If the Contractor and Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment for the amount for which the Architect is able to make such representations to the Owner. The Architect may also withhold a Certificate for Payment or, because of subsequently discovered evidence, may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the Architect's opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from acts and omissions described in Section 3.3.2, because of

§ 9.5.1.1 defective Work not remedied;

§ 9.5.1.2 third party claims filed or reasonable evidence indicating probable filing of such claims unless security acceptable to the Owner is provided by the Contractor;

§ 9.5.1.3 failure of the Contractor to make payments properly to Subcontractors or for labor, materials or equipment;

§ 9.5.1.4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;

§ 9.5.1.5 damage to the Owner or a separate contractor;

§ 9.5.1.6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; or

§ 9.5.1.7 repeated failure to carry out the Work in accordance with the Contract Documents.

§ 9.5.1.8 The failure of any Contractors to comply with mandatory requirements for maintaining record drawings. The Contractor shall be required to check record drawings each month. Written confirmation that the record drawings are up-to-date shall be required by the Architect before approval of the Contractors monthly payment requisition will be considered.

§ 9.5.2 When the above reasons for withholding certification are removed, certification will be made for amounts previously withheld.

§ 9.5.3 If the Architect withholds certification for payment under Section 9.5.1.3, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or material or equipment suppliers to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the Architect and the Architect will reflect such payment on the next Certificate for Payment.

## § 9.6 PROGRESS PAYMENTS

§ 9.6.1 After the Architect has issued a Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Architect. Notwithstanding Certification by the Architect, the Owner may refuse to make payment based on any default by the Contractor including, but not limited to those defaults set forth in Subparagraphs 9.5.1 through 9.5.1.8. The Owner shall not be deemed in default by reason of withholding payment while any of such defaults by the Contractor remain uncured.

§ 9.6.2 The Contractor shall pay each Subcontractor no later than seven days after receipt of payment from the Owner the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner.

§ 9.6.3 The Architect will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Architect and Owner on account of portions of the Work done by such Subcontractor.

§ 9.6.4 The Owner has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and material and equipment suppliers amounts paid by the Owner to the Contractor for subcontracted Work. If the Contractor fails to furnish such evidence within seven days, the Owner shall have the right to contact Subcontractors to ascertain whether they have been properly paid. Neither the Owner nor Architect shall have an obligation to pay or to see to the payment of money to a Subcontractor, except as may otherwise be required by law.

§ 9.6.5 Contractor payments to material and equipment suppliers shall be treated in a manner similar to that provided in Sections 9.6.2, 9.6.3 and 9.6.4.

§ 9.6.6 A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the Contract Documents.

§ 9.6.7 Unless the Contractor provides the Owner with a payment bond in the full penal sum of the Contract Sum, payments received by the Contractor for Work properly performed by Subcontractors and suppliers shall be held by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner. Nothing contained herein shall require money to be placed in a separate account and not commingled with money of the Contractor, shall create any fiduciary liability or tort liability on the part of the Contractor for breach of trust or shall entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

## § 9.7 FAILURE OF PAYMENT

If the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within seven days after receipt of the Contractor's Application for Payment, or if the Owner does not for reasons other than a default of the Contract, including but not limited to those defaults set forth in Subparagraphs 9.5.1.1 through 9.5.1.8 pay the Contractor within seven days after the date established in the Contract Documents the amount certified by the Architect or awarded by a court of law, then the Contractor may, upon seven additional days' written notice to the Owner and Architect, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended

## § 9.8 SUBSTANTIAL COMPLETION

§ 9.8.1 Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof which the Owner agrees to accept separately is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use. The Work will not be considered substantially complete until all project systems included in the Work are operational as designed and scheduled, all designated or required inspections, certifications, permits, approvals, licenses and other documents from any governmental authority having jurisdiction thereof necessary for the beneficial use and occupancy of the Project are received, designated instruction of Owner's personnel has been completed, and all final finishes within the Contract are in place. In general, the only remaining Work shall be minor in nature, so that the Owner can occupy the building on that date and the completion of the Work by the Contractor would not materially interfere or hamper the Owner's (or those claiming by, through or under the Owner) normal operations. Contractor recognizes that normal operation requires the use and occupancy of the Work by departmental employees without interruption and that any punchlist or corrective work shall be done at times when the Work is not to be occupied. As a further condition of substantial completion acceptance, the Contractor shall certify that all remaining Work will be completed within thirty (30) consecutive calendar days or as agreed upon following the date of substantial completion.

§ 9.8.1.1 In addition to the above, the following items must be completed in order to deem the work Substantially Complete:

- § 9.8.1.1.1 All required final inspections have been completed by the authority having jurisdiction resulting in a TCO or CO.
- § 9.8.1.1.2 Air Balancing Reports: Reports can be hand written field notes but must be reviewed and approved via the shop drawing process by the Mechanical engineer. Final Air and Water Balancing Reports certified by the licensed balancer are required for "Final Acceptance" and the start of the warranty period. (These reports must be submitted in accordance with the shop drawing process to Architect so that they can be tracked and approved and distributed to all applicable parties).
- § 9.8.1.1.3 Equipment Start Up Reports: Reports can be hand written field notes but must be reviewed and approved via the shop drawing process by the Mechanical Engineer. (These reports must be submitted in accordance with the shop drawing process to Architect so that they can be tracked and approved and distributed to all applicable parties).
- § 9.8.1.1.4 Completion of the Owner On-Site ATC Training: Refer to the ATC specifications for training requirements on-site and off-site. The Owner does not have beneficial use of the mechanical system until they can operate it following this training.
- § 9.8.1.1.5 Completion of Commissioning: Refer to the Start-up and Adjustment specifications. This process will require the Owner's Operator, Construction Manager (if applicable) and the Mechanical Engineer on site to witness a demonstration and operation of every mechanical device. The devices shall be operated from the on-site Owner's ATC Computer and verified by the Mechanical Contractor's field personnel to confirm proper operation. In addition to this demonstration, the contractor shall demonstrate Owner required maintenance of all mechanical equipment to maintain the manufacturer's warranty. This should include but not be limited to belt tension/adjustments, filters, etc. Please schedule several days for the commissioning process.

§ 9.8.2 When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall prepare and submit to the Architect a comprehensive list of items to be completed or corrected along with all special warranties required by the Contract Documents endorsed by the Contractor prior to final payment. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

§ 9.8.3 Upon receipt of the Contractor's list, the Architect will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Architect's inspection discloses any item, whether or not included on the Contractor's list, which is not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work or designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Architect. In such case, the Contractor shall then submit a request for another inspection by the Architect to determine Substantial Completion.



§ 9.8.4 When the Work or designated portion thereof is substantially complete, the Architect will prepare a Certificate of Substantial Completion that shall establish the date of Substantial Completion, shall establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance, and shall fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

§ 9.8.4.1 The Architect's Certificate of Substantial Completion shall be subject to the Owner's final approval.

§ 9.8.5 The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in such Certificate. Upon such acceptance and consent of surety, if any, the Owner shall make payment of retainage sufficient to increase the total payments to 100% of the Contract Sum, less such amounts as the Architect shall determine for all incomplete work and unsettled claims. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents.

## § 9.9 PARTIAL OCCUPANCY OR USE

§ 9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer as required under Section 11.3.1.5 and authorized by public authorities having jurisdiction over the Project. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor shall prepare and submit a list to the Architect as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Architect.

§ 9.9.2 Immediately prior to such partial occupancy or use, the Owner, Contractor and Architect shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

§ 9.9.3 Partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

## § 9.10 FINAL COMPLETION AND FINAL PAYMENT

§ 9.10.1 Upon receipt of the Contractor's written notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection and, when the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment stating that to the best of the Architect's knowledge, information and belief, and on the basis of the Architect's on-site visits and inspections, the Work has been completed in accordance with terms and conditions of the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Architect's final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled. All warranties and guarantees required pursuant to the Contract Documents shall be assembled and delivered by the Contractor to the Owner as part of the final application for payment. The final Certificate for Payment will not be issued by the Architect until all warranties and guarantees have been received and accepted by the Owner.

§ 9.10.1.1 The Architect's Certificate of Final Completion shall be subject to the Owner's final approval.

§ 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect and will not be canceled or allowed

to expire until at least 30 days' prior written notice has been given to the Owner, (3) a written statement that the Contractor knows of no substantial reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment and (5), if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts, releases and waivers of liens, claims, security interests or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner, and (6) evidence of compliance with all requirements of the Contract Documents: notices, certificates, affidavits, other requirements to complete obligations under the Contract Documents: including but not limited to (a) instruction of Owner's representatives in the operation of mechanical, electrical, plumbing and other systems, (b) delivery of keys to Owner with keying schedule: master, sub-master and special keys, (c) delivery to Architect of Contractor's General Warranty (as described in Paragraph 3.5) and each written warranty and assignment thereof prepared in duplicate, certificates of inspections, and bonds for Architect's review and delivery to Owner, (d) delivery to Architect a printed or typewritten operating, servicing, maintenance and cleaning instructions for all Work; parts lists and special tools for mechanical and electrical Work, in approval form, (e) delivery to the Architect of specified Project record documents and (f) delivery to Owner of a Final Waiver of Liens (AIA Document G706 or other form satisfactory to Owner), covering all Work including that of all Subcontractors, vendors, labor, materials and services, executed by an authorized officer and duly notarized. In addition to the foregoing, all other submissions required by other articles and paragraphs of the Specifications including final construction schedule shall be submitted to the Architect before approval of final payment.. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien. If such lien remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging such lien, including all costs and reasonable attorneys' fees.

§ 9.10.3 If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Architect so confirms, the Owner shall, upon application by the Contractor and certification by the Architect, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Architect prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of claims.

§ 9.10.4 The making of final payment shall constitute a waiver of Claims by the Owner except those arising from

- .1 liens, Claims, security interests or encumbrances arising out of the Contract and unsettled;
- .2 failure of the Work to comply with the requirements of the Contract Documents; or
- .3 terms of special warranties required by the Contract Documents.

§ 9.10.5 Acceptance of final payment by the Contractor, a Subcontractor or material supplier shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.

## § 9.11 LIQUIDATED DAMAGES

§ 9.11.1 The Contractor understands and agrees that all work must be performed in an orderly and closely coordinated sequence so that the date for substantial completion is met.

§ 9.11.2 If the Contractor fails to complete his work or fails to complete a portion of his work, he shall pay the Owner, as liquidated damages and not as a penalty, the sum as specified in the technical portion of the Contract Documents. Such amount is agreed upon as a reasonable and proper measure which the Owner will sustain each calendar day by failure of the Contractor to complete work within the stipulated time.

§ 9.11.3 Substantial Completion will be determined by the Architect and shall be deemed to be completion of the whole work for purposes of tolling the Municipal Mechanics Lien Law.

§ 9.11.4 For damage occurring at the time of delay, the Owner may retain the amount due to him under this clause from any payments due to the Contractor.

§ 9.11.5 The Owner will suffer financial loss if the project is not substantially complete on the date set forth in the Contract Documents. The Contractor (and the Contractor's Surety) shall be liable for and pay to the Owner the sum of \$500.00 stipulated and fixed, agreed as liquidated damages for each calendar day of delay until the Work is substantially complete.

## ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

### § 10.1 SAFETY PRECAUTIONS AND PROGRAMS

§ 10.1.1 The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the performance of the Contract.

§ 10.1.1.1 The Contractor must fully comply with the job safety requirements in addition to all Federal, State and Local safety guidelines. All cost associated with complying with all safety requirements shall be included in each contractor's base bid.

§ 10.1.1.2 The General Contractor will serve as the overall Project Safety Coordinator and shall be responsible for all issues of safety and protection. The Contractor shall designate a safety person at the job site while the contractor is working on the project site. The designated safety person shall be responsible for the safety of their work and for their workers and to make continuous inspections for all safety issues relating to his work. The Construction Manager (if applicable) is not responsible for safety on this project but will endeavor to promote safety. Each Contractor must comply with job Safety Requirements in addition to OSHA and local agency requirements. Failure to comply with safety issues will be grounds for withholding of payments.

§ 10.1.1.3 Contractor will comply with all reasonable requests of the Owner and Construction Manager (if applicable) with respect to additional security and protections required for work interfacing with Facility Operations. Safety is of the utmost importance on this project and all issues relative to safety and protection of the Facility, Staff and Occupants will be treated as emergency needs and will not be subject to the 7 day notice requirements of Article 14.

§ 10.1.1.3.1 General Contractor to provide, maintain, relocate and remove in coordination with Construction Manager if applicable, a 6 foot high, perimeter security fence. Fence will surround the building and proposed parking areas and will have signage attached at 100' intervals advising "Construction Area – Please Keep Out". General Contractor to be responsible for opening and securing site each day.

§ 10.1.1.3.2 Orange safety fencing will be installed around the entire area of any and all earthwork, excavations, etc. and will be maintained until the work is complete.

§ 10.1.1.3.3 This is a hard hat job. Identifying hard hats shall be worn at all times.

§ 10.1.1.3.4 Hot work permits will be issued by foreman for all activities involving open flames, Construction Manager (if applicable) will provide copy of Hot Work Permit Forms.

§ 10.1.1.4 The proper execution of the required safety provisions is directly related to the general condition safety line item on the schedule of values.

§ 10.1.1.5 The Contractor shall be responsible for the immediate investigation and resolution of all safety and environmental complaints / issues generated by contractor employees, owners, owner's representatives or members of the public.

§ 10.1.1.6 Contractor shall be maintain all egress routes throughout building. Contractor shall post exit signs as coordinated with Construction Manager (if applicable). Contractor shall provide wall hung fire extinguishers throughout building as deemed necessary by Construction Manager (if applicable) and fire officials.

§ 10.1.1.7 Contractor's safety representative shall perform a daily safety inspection walk through to ensure that all requirements of the OSHA Standards, Fire Protection Standards and Safe Work Practices are being complied with

and/or corrected. The responsibility of the Contractor is to provide a safe and healthy work environment for construction personnel. Owner's personnel and representative, and the public.

**§ 10.1.1.8** Upon written receipt of safety concerns and/or issues, the Contractor shall respond in writing addressing how the safety concerns or issues were resolved. The Construction Manager (if applicable) shall be copied on all safety related correspondence.

**§ 10.1.1.9** Prime Contractor's response and compliance with Construction manager's Project Manager (if applicable) and correction of deficiencies noted in Construction Manager's Safety Report is mandatory. Failure to comply will be grounds for withholding of progress payments until the conditions are acceptable to Construction Manager and OSHA.

**§ 10.1.1.10** The Contractor shall submit to Construction Manager (if applicable) a copy of all licenses (welding, power nailer, asbestos, etc, ) as required by applicable agencies.

**§ 10.1.1.11** Contractor shall have all required personal protective equipment and materials available for and used by each employee as required by Federal, State and Local guidelines.

**§ 10.1.1.12** Contractor shall supply proper equipment and crew sizes as necessary to safely complete the work.

**§ 10.1.1.13** Contractor shall provide documented safety training for each of their employees and subcontractor's employees no later than the first day they arrive on site. The training shall be documented and signed by the trainer and employee. A copy of all safety-training documents is to be provided to Construction Manager (if applicable) and updated as manpower loading increases.

**§ 10.1.1.14** The Contractor shall supply two (2) OSHA approved means of access / egress to each floor and roof for the course of the entire project for use by all applicable parties. The Contractor shall erect and maintain OSHA approved pedestrian walking bridges, for emergency access / egress and as necessary to protect personnel from overhead work. The number of protected entrances will be as determined by Construction Manager (if applicable).

**§ 10.1.1.15** The Contractor shall be responsible for providing and maintaining all temporary emergency egress routes. The Contractor shall obtain the approval of the Building and Fire Departments for all temporary emergency egress routes. General Contractor to provide for fire separation walls between occupied areas as required by local officials.

**§ 10.1.1.16** Contractor shall provide OSHA approved pedestrian walking bridges as necessary (determined by Construction Manager – if applicable) to protect against overhead hazards.

**§ 10.1.1.17** Contractor shall provide, relocate and / or maintain barricades, signage, provide flagmen etc. as necessary to ensure public safety and safe egress. Contractor to provide, maintain, relocate and remove in coordination with Construction Manager, if applicable to protect against overhead hazards.

**§ 10.1.1.18** Notify Construction Manager (if applicable) immediately upon arrival of OSHA to the site.

**§ 10.1.1.19** Contractor shall submit to Construction Manager (if applicable), all MSDS sheets and shall cooperate in the posting of all required notifications relative to the use of hazardous substances on the property. Contractor to comply with NJ Law regarding the use or storage of hazardous substances in Buildings. MSDS sheets shall be posted prior to product being delivered to site.

**§ 10.1.1.10** Contractor, subcontractor, vendor, etc should enforce a full time no smoking or alcohol use policy for all employees during the entire course of the project. Any worker found violating these reflections, or being belligerent, will be subject to removal from the site at the sole discretion of Construction Manger, if applicable.

**§ 10.1.1.11** Contractor shall be responsible to secure the site at the end of each workday by an effective means and maintain until all parties determine no longer required.



§ 10.1.1.12 For the safety of occupants, staff, and the public, the steel erection must be scheduled and coordinated with the Owner and Construction Manager (if applicable). Swinging of steel and crane boom over occupied space will not be allowed. Steel contractor shall provide additional barricades and fencing around his crane and steel at all times.

§ 10.1.1.13 Contractor must submit an acceptable OSHA compliant site specific written safety plan to Construction Manager (if applicable) for review within fourteen (14) days from the notice to proceed or prior to mobilizing on site, whichever comes first. The written safety plan shall include (as applicable to their work) but is not limited to the following:

- Full time no smoking policy or alcohol use is allowed on the project. Any worker found violating these restrictions, or being belligerent, will be subject to removal from the site. (Contractors shall post required signs).
- Full time hard hat policy (identifying hard hats shall be worn at all times).
- Site specific emergency action plan with contractor phone numbers, active 24 hours a day, 7 days a week.
- Competent on site safety representative, named and active (Provide alternate)
- Scaffold erection plan, including a log of daily inspections.
- Full time fall protection plan and exposures over 6'-0"
- Job site signage plan (perimeter fence warning signs posted 50'-0" o.c.
- First aid and CPR provisions
- OSHA 200 log and Job Safety and Health Protection Poster
- Daily clean up.
- Hazard Communication Program with MSDS logged and maintained.
- Hazard Communication program.
- Daily diary of work, issues, and incident, etc.
- Sheeting, shoring and excavations protection line.
- GFI safety program
- Hazardous Energy Control Lock out tag out program
- Required safety clothes; Eye and ear protection, respirators, boots, belts, gloves etc. as appropriate to their work requirement.
- Fire Extinguishers.
- Removal guard rail and protection at material loading areas, 200lb force minimum requirement.
- All stairs and platforms must have railings, 200lb force minimum requirement. Stair pans and landings must be filled prior to their use.
- Daily inspection of tools and equipment; verify safety devices are operational.
- Ladder usage plan
- Weekly tool box meetings, documented and signed by each employee.
- Temporary heat procedures.

§ 10.1.1.14 Contractor shall maintain and submit a complete copy of the written safety plan, logs, diaries, plans and programs on site for the Construction Manager (if applicable).

§ 10.1.1.15 The speed limit within the project property is 5MPH. Contractor employees operating vehicles in excess of the speed limit or in any otherwise unsafe manner will be directed to leave the site and not permitted to return.

## § 10.2 SAFETY OF PERSONS AND PROPERTY

§ 10.2.1 The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury or loss to

- .1 employees on the Work and other persons who may be affected thereby;
- .2 the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody or control of the Contractor or the Contractor's Subcontractors or Sub-subcontractors; and
- .3 other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction as well as any other real or personal property of the Owner.

§ 10.2.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities bearing on safety of persons or property or their protection from damage, injury or loss.

§ 10.2.2.1 Contractor shall comply with all regulations required by the Federal Occupational Safety and Health Act (OSHA).

§ 10.2.2.2 The Contractor shall conform to all applicable New Jersey Department of Environmental Protection regulations.

§ 10.2.2.3 Contractors must comply with Construction and Environmental Standards contained in Federal and State Regulations and other applicable laws.

§ 10.2.2.4 It is the Contractor's responsibility to determine the existence of potentially hazardous materials, including lead, and to protect his workmen and the work area.

§ 10.2.3 The Contractor shall erect and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards, promulgating safety regulations and notifying owners and users of adjacent sites and utilities.

§ 10.2.4 When use or storage of explosives or other hazardous materials or equipment or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel.

§ 10.2.5 The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Sections 10.2.1.2 and 10.2.1.3 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2 and 10.2.1.3, except damage or loss attributable to acts or omissions of the Owner or Architect or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Section 3.18.

§ 10.2.6 The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner and Architect.

§ 10.2.7 The Contractor shall not permit any part of the construction or site to be loaded so as to cause damage or create an unsafe condition.

#### § 10.2.8 INJURY OR DAMAGE TO PERSON OR PROPERTY

If either party suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, written notice of such injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding 21 days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

§ 10.2.9 The Contractor shall provide and maintain in good operating condition suitable and adequate fire protection equipment, and shall comply with all reasonable recommendations regarding fire protection made by the representatives of the fire insurance company carrying insurance on the Work or by the local fire chief for fire marshal. The area within the site limits under the Contractor's control shall be kept orderly and clean, and all combustible rubbish shall be promptly removed from the site. Contractor will comply with all reasonable requests of the Owner and Construction Manager with respect to additional security and protections required for work interfacing with Owner's Operations. Safety is of the utmost importance on this project and all issues relative to safety and protection of the staff and public will be treated as emergency needs and will not be subject to the 7-day notice requirements of Article 14.

§ 10.2.10 The Contractor shall remove snow or ice which may accumulate on the site within areas under his control which might result in damage or delay.

§ 10.2.11 The Contractor shall take all precautions necessary to prevent loss or damage caused by vandalism, theft, burglary, pilferage, or unexplained disappearance of property of the Owner and Contractor, whether or not forming part of the Work, located within those areas of the Project to which the Contractor has access. Whenever unattended, including nights and weekends, mobile equipment and operable machinery shall be kept locked and made inoperable and immovable.

§ 10.2.12 Neither the Owner nor the Architect shall be responsible for providing a safe working place for the Contractor, the Subcontractors or their employees, or any individual responsible to them for the work.

§ 10.2.13 The Contractor shall conform to requirements of OSHA, the Construction Safety Code of the State Department of Labor and those of the AGC Manual. The requirements of the New Jersey and Local Building Construction Codes shall apply where there are equal to or more restrictive than the requirements of the Federal Act.

§ 10.2.14 When all or a portion of the Work is suspended for any reason, the Contractor shall securely fasten down all coverings and protect the Work as necessary from injury or any cause.

§ 10.2.15 The Contractor shall promptly report in writing to the Owner and Architect all accidents arising out of or in connection with the Work which caused death, personal injury or property damage giving full details and statements of any witnesses. In addition, if death, serious personal injury or serious property damage is caused, the accident shall be reported immediately by telephone or messenger to the Owner and Architect.

§ 10.2.16 Contractor is required to follow and enforce the work rules set forth below. Failure to comply with or enforce any of these rules will be grounds for suspension and/or termination of this contract:

§ 10.2.16.1 No use of alcoholic beverages prior to or during working hours.

§ 10.2.16.2 No use of illegal drugs or prescription medications which could induce drowsiness or otherwise impair perception or performance. Use of illegal drugs may result in prosecution to the fullest extent of the law. Any warning associated with use of prescription drugs must be complied with, particularly warning against operation of machinery and equipment.

§ 10.2.16.3 No horseplay or rough-housing will be allowed.

§ 10.2.16.4 No sexual, racial, or ethnic harassment, or similar conduct will be tolerated.

§ 10.2.16.5 All employees shall use proper sanitation habits including use of toilet facilities and garbage cans.

§ 10.2.16.6 All employees shall dress in clothing appropriate for the work they are to perform. All personnel are to wear hardhats, safety shoes, glasses, gloves, masks or respirators, noise protection devices, and other protective clothing and equipment as required by OSHA standards.

§ 10.2.16.7 All equipment is to be properly stored and/or secured at the end of the work day or if it is to remain idle for greater than one hour.

§ 10.2.16.8 All personnel are to be made aware of the availability of Material Safety Data Sheets for materials used at the Project site. This information is available from the Contractor using the product. The Contractor shall maintain a copy of all MSDS forms at the construction site office for all personnel to review.

### § 10.3 HAZARDOUS MATERIALS

§ 10.3.1 The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death

to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and report the condition to the Owner and Architect in writing.

§ 10.3.2 Upon receipt of the Contractor's written notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of such material or substance or who are to perform the task of removal or safe containment of such material or substance. The Contractor and the Architect will promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor and the Architect have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased in the amount of the Contractor's reasonable additional costs of shut-down, delay and start-up.

§ 10.3.3 To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Architect, Architect's consultants and agents and employees of any of them from and against claims, damages, losses and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance presents the risk of bodily injury or death as described in Section 10.3.1 and has not been rendered harmless, provided that such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), except to the extent that such damage, loss or expense is due to the fault or negligence of the party seeking indemnity.

§ 10.3.4 The Owner shall not be responsible under this Section 10.3 for materials or substances the Contractor brings to the site unless such materials or substances are required by the Contract Documents. The Owner shall be responsible for materials or substances required by the Contract Documents, except to the extent of the Contractor's fault or negligence in the use and handling of such materials or substances.

§ 10.3.5 The Contractor shall indemnify the Owner for the cost and expense the Owner incurs (1) for remediation of a material or substance the Contractor brings to the site and negligently handles, or (2) where the Contractor fails to perform its obligations under Section 10.3.1, except to the extent that the cost and expense are due to the Owner's fault or negligence.

§ 10.3.6 If, without negligence on the part of the Contractor, the Contractor is held liable by a government agency for the cost of remediation of a hazardous material or substance solely by reason of performing Work as required by the Contract Documents, the Owner shall indemnify the Contractor for all cost and expense thereby incurred.

#### § 10.4 EMERGENCIES

In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 15 and Article 7.

### ARTICLE 11 INSURANCE AND BONDS

#### § 11.1 CONTRACTOR'S LIABILITY INSURANCE

##### § 11.1.1

*(Paragraphs deleted)*

Contractor shall without in any way altering Contractor's liability under the Contract or applicable law, obtain, pay for and maintain insurance for the coverages and amounts of coverage not less than those set forth below in the Instructions to Bidders and shall provide to Owner certificates issued by insurance companies satisfactory to Owner to evidence such coverage no later than 7 days from the date of the execution of this Contract and prior to any personnel or equipment being brought onto and/or before any work commences at the job site. The coverage afforded under any insurance obtained pursuant to this paragraph shall be primary to any valid and collectible insurance carried separately by any of the indemnities. Such certificates shall provide that there shall be no

termination, nonrenewal, modification, or expiration of such coverage without thirty (30) days prior written notice to Owner. In the even of any failure by Contractor to comply with the provisions of this Paragraph 11.1, Owner may, at its option, on notice to Contractor, suspend the Contract for cause until there is full compliance with this Paragraph 11.1 and/or terminate the Contract for cause. Alternatively, Owner may purchase such insurance at Contractor's expense, provided that Owner shall have no obligation to do so, and if Owner shall do so, Contractor shall not be relieved of or excused from the obligation to obtain and maintain such insurance amounts and overages. Contractor shall provide to Owner a coy of any and all applicable insurance policies. Architect and the State of New Jersey shall be named as an additional insured on all Insurance Policies to the provided by the Contractor. The Owner shall be named as an additional primary insured on all Insurance Policies to be provided by the Contractor..

§ 11.1.2 Contractor shall require all Subcontractors to carry similar insurance coverages and limits of liability as required under this Article 11, adjusted to the nature of Subcontractors' operations and submit same to Owner for approval before any personnel or equipment is brought onto the site and/or before any work commences.

§ 11.1.3 In the event Contractor fails to obtain the required certificates of insurance from the Subcontractor and a claim is made or suffered, the Contractor shall indemnify, defend and hold harmless the Owner, Architect, and the Sate of New Jersey from any and all claims for which the required insurance would have provide coverage. This indemnity obligation is in addition to any other indemnity obligation provided in the Contract.

§ 11.1.4 The Contractor shall cause the commercial liability coverage required by the Contract Documents to include (1) the Owner, the Architect and the Architect's consultants as additional insureds for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's operations; and (2) the Owner as an additional insured for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's completed operations.

*(Paragraphs deleted)*



#### § 11.4 PERFORMANCE BOND AND PAYMENT BOND

§ 11.4.1 Contractor shall furnish a performance bond and labor and material payment bond meeting all statutory requirements of the State of New Jersey in form and substance satisfactory to the Owner and without limitation complying with requirements set forth in the Instructions to Bidders.

§ 11.4.2 If any of the foregoing insurance coverages are required to remain in force after final payment, including, but not limited to coverage for completed operations, an additional certificate evidencing continuation of such coverage shall be submitted with the Final Application for Payment.

§ 11.4.3 In no event shall any failure of the Owner to receive certified copies or certificates of policies required under Paragraph 11.1 or to demand receipt of such certified copies or certificates prior to the Contractor commencing Work be construed as a waiver of the Owner or the Architect of the Contractor's obligations to obtain insurance pursuant to this Article 11. The obligation to procure and maintain any insurance required by this Article 11 is a separate responsibility of the Contractor and independent of the duty to furnish a certified copy or certificate of such insurance policies.

§ 11.4.4 If the Contractor fails to purchase and maintain or require to be purchased and maintained any insurance required under this Paragraph 11.1, the Owner may, but shall not be obligated to, upon 5 days written notice to the Contractor, purchase such insurance on behalf of the Contractor and shall be entitled to deduct said cost from the Contractor's Contract Sum.

§ 11.4.5 When any required insurance due to the attainment of a normal expiration date or renewal date shall expire the Contractor shall supply the Owner with certificates of insurance and amendatory riders or endorsements that clearly evidence the continuation of all coverage in the same manner, limits of protection and scope as was provided by the previous policy. In the event any renewal or replacement policy for whatever reason obtained or required is written by a carrier other than that with whom the coverage was previously placed or the subsequent policy differs in any way from the previous policy, the Contractor shall also furnish replacement policy unless the Owner provided the Contractor with prior written consent to submit only a certificate of insurance for any such policy. All renewal and or replacement policies shall be in form and substance satisfactory to the Owner and written by carriers acceptable to the Owner.

§ 11.4.6 The Contractor shall cause each subcontractor to (1) procure insurance in the amounts set forth in Paragraph 11.2 and (2) name the indemnities under Paragraph 3.18 as additional insureds under the subcontractor's comprehensive general liability policy. The additional insured endorsements included on the subcontractor's comprehensive general liability policy shall state that coverage is afforded the additional insureds with respect to claims arising out of operations performed by or on behalf of the Contractor. If the additional insureds have other insurance which is applicable to the claims, such other insurance shall be on an excess or contingent basis. The amount of the insurance liability under this insurance policy shall not be reduced by the existence of such other insurance.

§ 11.4.7 Property insurance provided by the Owner shall not cover any tools, apparatus, machinery, scaffolding, hoists, forms, staging, shoring, or other similar items commonly referred to as construction equipment which may be on the site and the capital value of which is not included in the work. The Contractor shall make its own arrangements for any insurance it might require on such construction requirement. Any such policy obtained by the Contractor under this Paragraph 11.4.7 shall include a waiver of subrogation.

§ 11.4.8 The Contractor may carry whatever additional insurance he deems necessary to protect himself against hazards not covered for theft, collapse, water damage, materials and equipment stored on the site, and for materials and equipment stored off site, and against loss of owned or rented capital equipment and tools owned by mechanics or any tools, equipment, scaffolding, stagings, towers and forms owned or rented by the Contractor, the capital value of which is not included in the cost of the Work.

§ 11.4.9 All insurance coverage procured by the Contractor shall be provided by insurance companies having policy holder ratings no lower than "A" and financial rating no lower than "X" in the Best's Insurance guide, latest edition in effect as of the date of the Contract and subsequently in effect at the time of the renewal of the policies required by the Contract Documents.

§ 11.4.10 If the Owner or the Contractor is damaged by the failure of the other party to purchase or maintain insurance required under Article 11, then the party who failed to purchase or maintain the insurance shall bear all reasonable costs (including attorneys fees and court and settlement costs) properly attributable thereto.

§ 11.4.11 The Contractors must remove all "X, C & U" exclusions from their policies.

## ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

### § 12.1 UNCOVERING OF WORK

§ 12.1.1 If a portion of the Work is covered contrary to the Architect's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by the Architect, be uncovered for the Architect's examination and be replaced at the Contractor's expense without change in the Contract Time or Contract Sum.

§ 12.1.2 If a portion of the Work has been covered that the Architect has not specifically requested to examine prior to its being covered, the Architect may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, costs of uncovering and replacement shall, by appropriate Change Order, be at the Owner's expense. If such Work is not in accordance with the Contract Documents, such costs and the cost of correction shall be at the Contractor's expense unless the condition was caused by the Owner or a separate contractor in which event the Owner shall be responsible for payment of such costs.

### § 12.2 CORRECTION OF WORK

#### § 12.2.1 BEFORE OR AFTER SUBSTANTIAL COMPLETION

The Contractor shall promptly correct Work rejected by the Architect or failing to conform to the requirements of the Contract Documents, whether discovered before or after Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the Architect's services and expenses made necessary thereby, shall be at the Contractor's expense. If prior to the date of Substantial Completion the Contractor, a subcontractor or anyone for whom either is responsible, uses or damages any portion of the Work, including without limitation, mechanical, electrical, plumbing and other building systems, machinery, equipment or other mechanical device, the Contractor shall cause each such item to be restored to "like new conditions" at no expense to the Owner.

#### § 12.2.2 AFTER SUBSTANTIAL COMPLETION

§ 12.2.2.1 In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Final Acceptance of the Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9.1, or by terms of an applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of written notice from the Owner to do so unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner or Architect, the Owner may correct it in accordance with Section 2.4.

§ 12.2.2.1.1 The obligations under Paragraph 12.2 shall cover any repairs and replacement to any part of the Work or other property caused by the defective Work.

§ 12.2.2.1.2 Upon completion of any work under or pursuant to this Paragraph 12.2, the two year correction period in connection with the work requiring correction shall be renewed and recommenced.

§ 12.2.2.2 The two -year period for correction of Work shall be extended with respect to portions of Work first performed after Final Acceptance by the period of time between Final Acceptance and the actual completion of that portion of the Work.

§ 12.2.2.3 The two-year period for correction of Work shall be extended by corrective Work performed by the Contractor pursuant to this Section 12.2.

§ 12.2.3 The Contractor shall remove from the site portions of the Work that are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

§ 12.2.4 The Contractor shall bear the cost of correcting destroyed or damaged construction, whether completed or partially completed, of the Owner or separate contractors caused by the Contractor's correction or removal of Work that is not in accordance with the requirements of the Contract Documents.

§ 12.2.5 Nothing contained in this Section 12.2 shall be construed to establish a period of limitation with respect to other obligations the Contractor has under the Contract Documents. Establishment of the one-year period for correction of Work as described in Section 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

#### § 12.3 ACCEPTANCE OF NONCONFORMING WORK

If the Owner prefers to accept Work that is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

**§ 12.3.1** This Subparagraph relates exclusively to the knowing acceptance of nonconforming work by the Owner. It has no applicability to work accepted by the Owner or Architect without the knowledge that such work fails to conform to the requirements of the Contract Documents.

### ARTICLE 13 MISCELLANEOUS PROVISIONS

#### § 13.1 GOVERNING LAW

The Contract shall be governed by the law of the place where the Project is located except that, if the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4.

#### § 13.2 SUCCESSORS AND ASSIGNS

§ 13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns and legal representatives to covenants, agreements and obligations contained in the Contract Documents. Except as provided in Section 13.2.2, neither party to the Contract shall assign the Contract as a whole without written consent of the other. If either party attempts to make such an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

§ 13.2.2 The Owner may, without consent of the Contractor, assign the Contract to a lender providing construction financing for the Project, if the lender assumes the Owner's rights and obligations under the Contract Documents. The Contractor shall execute all consents reasonably required to facilitate such assignment.

#### § 13.3 WRITTEN NOTICE

Written notice shall be deemed to have been duly served if delivered in person to the individual, to a member of the firm or entity, or to an officer of the corporation for which it was intended; or if delivered at, or sent by registered or certified mail or by courier service providing proof of delivery to, the last business address known to the party giving notice.

#### § 13.4 RIGHTS AND REMEDIES

§ 13.4.1 Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights and remedies otherwise imposed or available by law.



§ 13.4.2 No action or failure to act by the Owner, Architect or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach there under, except as may be specifically agreed in writing.

## § 13.5 TESTS AND INSPECTIONS

§ 13.5.1 Tests, inspections and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections and approvals. The Contractor shall give the Architect timely notice of when and where tests and inspections are to be made so that the Architect may be present for such procedures. The Owner shall bear costs of (1) tests, inspections or approvals that do not become requirements until after bids are received or negotiations concluded, and (2) tests, inspections or approvals where building codes or applicable laws or regulations prohibit the Owner from delegating their cost to the Contractor.

§ 13.5.2 If the Architect, Owner or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection or approval not included under Section 13.5.1, the Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection or approval by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Architect of when and where tests and inspections are to be made so that the Architect may be present for such procedures. Such costs, except as provided in Section 13.5.3, shall be at the Owner's expense.

§ 13.5.3 If such procedures for testing, inspection or approval under Sections 13.5.1 and 13.5.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure including those of repeated procedures and compensation for the Architect's services and expenses shall be at the Contractor's expense. The Contractor also agrees that the cost of testing services required for the convenience of the Contractor in his scheduling and performance of the Work and the cost of testing services related to remedial operations performed to correct deficiencies in the Work shall be borne by the Contractor.

§ 13.5.4 Required certificates of testing, inspection or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Architect.

§ 13.5.5 If the Architect is to observe tests, inspections or approvals required by the Contract Documents, the Architect will do so promptly and, where practicable, at the normal place of testing.

§ 13.5.6 Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

## § 13.6 INTEREST

§ 13.6.1 The Contractor shall not be entitled to any payment of interest for any reason, action or inaction by the Architect or the Owner.

§ 13.6.2 Any payments withheld for time delays, faulty materials, or workmanship, shall not bear interest for period of delay or non-acceptance.

## § 13.7 TIME LIMITS ON CLAIMS

Owner and Contractor issues including the applicable statute of limitations shall be as governed by New Jersey Law.

## ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

### § 14.1 TERMINATION BY THE CONTRACTOR

§ 14.1.1 The Contractor may terminate the Contract in the manner provided in Subparagraph 14.1.2 if repeated suspensions, delays or interruptions by the Owner as described in Paragraph 14.3 constitute in the aggregate more than 100% of the total number of days scheduled for completion or 120 days in any 365 day period, whichever is less, or if all the Work is entirely stopped for a continuous period of 60 consecutive days through no act or fault of the Contractor or a Subcontractor, Sub-subcontractor or their agents or employees or any other persons or entities

performing portions of the Work under direct or indirect contract with the Contractor, for any of the following reasons:

- .1 Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;
- .2 An act of government, such as a declaration of national emergency that requires all Work to be stopped;
- .3 because the Architect has not issued certificate for payment and has not notified the Contractor of the reason for withdrawing certification as provided in Subparagraph 9.4.1, or because the Owner has not made payment on a certificate for payment (without cause) within the time stated in the Contract Documents.
- .4

§ 14.1.2 If one of the above reasons exist, the Contractor may upon fourteen (14) days written notice to the Owner and Architect, terminate the Contract unless this reason is cured prior to the expiration of the notice, and recover from the Owner payment of Work properly executed in accordance with the Contract Documents (the basis for such payment shall be as provided in the Contract) and for payment for cost directly related to work thereafter performed by Contractor in terminating such work including reasonable demobilization and cancellation charges provided said Work is authorized in advance by Architect and Owner.

§ 14.1.3 The Owner shall not be responsible for damages for loss of anticipated profits on work not performed on account of any termination described in Subparagraph 14.1.1 and 14.1.2.

§ 14.1.4 If the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor or a Subcontractor or their agents or employees or any other persons performing portions of the Work under contract with the Contractor because the Owner has repeatedly failed to fulfill the Owner's obligations under the Contract Documents with respect to matters important to the progress of the Work, the Contractor may, upon seven additional days' written notice to the Owner and the Architect, terminate the Contract and recover from the Owner as provided in Section 14.1.3.

#### § 14.2 TERMINATION BY THE OWNER FOR CAUSE

§ 14.2.1 The Owner may terminate the Contract if the Contractor

- .1 refuses or fails to supply enough properly skilled workers or proper materials and/or equipment;
- .2 fails to make proper payment to Subcontractors for materials or labor in accordance with the respective agreements between the Contractor and the Subcontractors;
- .3 disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or
- .4 Disregards the instructions of Architect or Owner (when such instructions are based on the requirements of the Contract Documents;
- .5 Is adjudged bankrupt or insolvent, or makes a general assignment for the benefit of Contractor's creditors, or a trustee or a receiver is appointed for Contractor or for any of its property, or files a petition to take advantage of any debtor's act, or to recognize under bankruptcy or similar laws; or
- .6 Breaches any warranty made by the Contractor under or pursuant to the Contract Documents.
- .7 Fails to furnish the Owner with assurances satisfactory to the Owner evidencing the Contractor's ability to complete the Work in compliance with the requirements of the Contract Documents.
- .8 Fails after the commencement of the Work to proceed continuously with the construction and completion of the work for more than 10 days except as permitted under the Contract Documents.
- .9 Otherwise does not fully comply with the Contract Documents.

§ 14.2.2 When any of the above reasons exist, the Owner, upon certification by the Initial Decision Maker that sufficient cause exists to justify such action, may without prejudice to any other rights or remedies of the Owner and

after giving the Contractor and the Contractor's surety, if any, seven days' written notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

- .1 Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;
- .2 Accept assignment of subcontracts pursuant to Section 5.4; and
- .3 Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

§ 14.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished.

§ 14.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Architect's services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall be certified by the Initial Decision Maker, upon application, and this obligation for payment shall survive termination of the Contract.

#### § 14.3 SUSPENSION BY THE OWNER FOR CONVENIENCE

§ 14.3.1 The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work in whole or in part for such period of time as the Owner may determine.

§ 14.3.2 The Contract Sum and Contract Time shall be adjusted for increases in the cost and time caused by suspension, delay or interruption as described in Section 14.3.1. Adjustment of the Contract Sum shall include profit. No adjustment shall be made to the extent

- .1 that performance is, was or would have been so suspended, delayed or interrupted by another cause for which the Contractor is responsible; or
- .2 that an equitable adjustment is made or denied under another provision of the Contract.

#### § 14.4 TERMINATION BY THE OWNER FOR CONVENIENCE

§ 14.4.1 The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause.

§ 14.4.2 Upon receipt of written notice from the Owner of such termination for the Owner's convenience, the Contractor shall

- .1 cease operations as directed by the Owner in the notice;
- .2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and
- .3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

§ 14.4.3 In case of such termination for the Owner's convenience, the Contractor shall be entitled to receive payment for Work executed, and costs incurred by reason of such termination, along with reasonable overhead and profit on the Work not executed.

§ 14.4.4 If Owner terminates the Contract for cause pursuant to Paragraph 14.2 and it is subsequently determined that the Owner was not authorized to terminate the Contract as provided in Paragraph 14.2, the Owner's termination shall be treated as a termination for convenience under this Paragraph 14.4 and the rights and obligations of the parties shall be the same as if the Owner has issued a notice of termination to the Contractor as provided in this Paragraph 14.4.

### ARTICLE 15 CLAIMS AND DISPUTES

#### § 15.1 CLAIMS

##### § 15.1.1 DEFINITION

A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in

question between the Owner and Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim.

#### § 15.1.2 NOTICE OF CLAIMS

Claims by either the Owner or Contractor must be initiated by written notice to the other party and to the Initial Decision Maker with a copy sent to the Architect, if the Architect is not serving as the Initial Decision Maker. Claims by either party must be initiated within 5 days after occurrence of the event giving rise to such Claim or within 5 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.

#### § 15.1.3 CONTINUING CONTRACT PERFORMANCE

Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract in accordance with the Contract Documents. The Architect will prepare Change Orders and issue Certificates for Payment in accordance with the decisions of the Initial Decision Maker.

#### § 15.1.4 CLAIMS FOR ADDITIONAL COST

If the Contractor wishes to make Claim for an increase in the Contract Sum written notice as provided herein shall be given to the Owner, Architect and Construction Manager (if applicable) before proceeding to execute the Work and within five (5) days after the occurrence of the event giving rise to such Claim for increase in the Contract Sum. The foregoing written notice shall contain a written statement from the Contractor setting forth in detail the nature and cause of the Claim and an itemized statement of the increase requested. No such written notice shall form the basis of an increase to the Contract Sum unless and until such increase has been authorized by a written Change Order executed and issued according to the terms and conditions set forth herein. The Contractor hereby acknowledges that the Contractor shall not have any right to and the Owner will not consider any requests for an increase in the Contract Sum that is not submitted in compliance with the foregoing requirements. Prior notice is required for Claims relating to an emergency endangering life or property arising under Section 10.6.

#### § 15.1.5 CLAIMS FOR ADDITIONAL TIME

§ 15.1.5.1 If the Contractor wishes to make Claim for an increase in the Contract Time, written notice as provided herein shall be given. Said notice shall itemize all claims and shall contain sufficient detail and substantiating data to permit evaluation of same by Owner and Architect. No such claim shall be valid unless so made. The Contractor's Claim shall include an estimate of cost and probable effect of delay on progress of the Work. In the case of a continuing delay only one Claim is necessary. Any change in the Contract Sum resulting from such Claim shall be authorized only by Change Order or Construction Change Directive, as the case may be. All required notices for additional costs shall be made by Certified Mail.

§ 15.1.5.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated and had an adverse effect on the scheduled construction.

#### § 15.1.6 CLAIMS FOR CONSEQUENTIAL DAMAGES

The Owner may claim consequential damages arising out of or relating to this Contract. This includes

1. damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons;

#### § 15.2 INITIAL DECISION

§ 15.2.1 Claims, excluding those arising under Sections 10.3, 10.4, 11.3.9, and 11.3.10, shall be referred to the Initial Decision Maker for initial decision. The Architect will serve as the Initial Decision Maker, unless otherwise indicated in the Agreement. Except for those Claims excluded by this Section 15.2.1, an initial decision shall be required as a condition precedent to mediation of any Claim arising prior to the date final payment is due, unless 30 days have passed after the Claim has been referred to the Initial Decision Maker with no decision having been rendered. Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.

§ 15.2.2 The Initial Decision Maker will review Claims and within ten days of the receipt of a Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) reject the Claim in whole or in part, (3) approve the Claim, (4) suggest a compromise, or (5) advise the parties that the Initial Decision Maker is unable to resolve the Claim if the Initial Decision Maker lacks sufficient information to evaluate the merits of the Claim or if the Initial Decision Maker concludes that, in the Initial Decision Maker's sole discretion, it would be inappropriate for the Initial Decision Maker to resolve the Claim.

§ 15.2.3 In evaluating Claims, the Initial Decision Maker may, but shall not be obligated to, consult with or seek information from either party or from persons with special knowledge or expertise who may assist the Initial Decision Maker in rendering a decision. The Initial Decision Maker may request the Owner to authorize retention of such persons at the Owner's expense.

§ 15.2.4 If the Initial Decision Maker requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond, within ten days after receipt of such request, and shall either (1) provide a response on the requested supporting data, (2) advise the Initial Decision Maker when the response or supporting data will be furnished or (3) advise the Initial Decision Maker that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Initial Decision Maker will either reject or approve the Claim in whole or in part.

§ 15.2.5 The Initial Decision Maker will render an initial decision approving or rejecting the Claim, or indicating that the Initial Decision Maker is unable to resolve the Claim. This initial decision shall (1) be in writing; (2) state the reasons therefor; and (3) notify the parties and the Architect, if the Architect is not serving as the Initial Decision Maker, of any change in the Contract Sum or Contract Time or both. The initial decision shall be final and binding on the parties but subject to mediation and, if the parties fail to resolve their dispute through litigation mediation, to binding dispute resolution.

§ 15.2.5.1 Any dispute arising under the Contract shall be resolved in accordance with and subject to the limitations contained in N.J.S.A. 40A:11-41.1 as follows:

§ 15.2.5.1.1 All remedies provided elsewhere in the Contract Documents to resolve disputes, claims and protests shall be exhausted. Where the Engineer or Architect is required to issue a decision, such decision shall be a condition precedent to proceeding to resolve the dispute in accordance with Paragraph 2.

§ 15.2.5.1.2 Prior to litigation, the Owner and Contractor shall endeavor to settle disputes by mediation in accordance with the current Construction Industry Mediation Rules of the American Arbitration Association. Demand for mediation shall be filed in writing by the party requesting mediation with the other party to this Agreement and with the American Arbitration Association. The Engineer or Architect shall be provided with an information copy of the demand unless the Engineer or Architect is joined. In no event shall such demand be made more than 30 days after completion, acceptance and final payment nor after the date when institution of legal or equitable proceeding regarding the matter in dispute would be barred as a matter of law.

§ 15.2.5.1.3 Nothing herein shall be constructed to prevent the Owner and Contractor from agreeing to utilize any other alternative dispute resolution procedure in lieu of or in addition to mediation.

§ 15.2.5.1.4 Nothing herein shall be construed to prevent the Owner from notifying any performance guarantor (Surety) of, and requesting the Surety's assistance in resolving any disputes which involve the Contractor's performance.

§ 15.2.6 Either party may file for mediation of an initial decision at any time, subject to the terms of Section 15.2.6.1.

§ 15.2.6.1 Either party may, within 30 days from the date of an initial decision, demand in writing that the other party file for mediation within 60 days of the initial decision. If such a demand is made and the party receiving the



demand fails to file for mediation within the time required, then both parties waive their rights to mediate or pursue binding dispute resolution proceedings with respect to the initial decision.

§ 15.2.7 In the event of a Claim against the Contractor, the Owner may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor's default, the Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

§ 15.2.8 If a Claim relates to or is the subject of a mechanic's lien, the party asserting such Claim may proceed in accordance with applicable law to comply with the lien notice or filing deadlines.

### § 15.3 MEDIATION

§ 15.3.1 Claims, disputes, or other matters in controversy arising out of or related to the Contract except those waived as provided for in Sections 9.10.4, 9.10.5, and 15.1.6 shall be subject to mediation as a condition precedent to non-binding dispute resolution.

§ 15.3.2 The mediation shall be pursuant to industry standards prior to being submitted to a court for adjudication.

*(Paragraph deleted)*

### § 15.4 NON-BINDING ARBITRATION

§ 15.4.1 If agreed to by Owner, non-binding arbitration shall be pursuant to industry standards prior to being submitted to a court for adjudication.

*(Paragraphs deleted)*

## PREVAILING WAGE RATES

## **PREVAILING WAGE RATES**

1. To obtain current prevailing wage rates, visit the following website:  
[http://lwd.dol.state.nj.us/labor/wagehour/wagerate/prevailing\\_wage\\_determinations.html](http://lwd.dol.state.nj.us/labor/wagehour/wagerate/prevailing_wage_determinations.html)

**END OF SECTION**



## **SCHEDULE OF DRAWINGS**

The following contract drawings are herein made part of the project specifications:

C-1	COVER SHEET AND INDEX OF DRAWINGS, AND LEGEND
C-2	ADA GUIDELINES
D-1	BASEMENT FLOOR DEMOLITION PLAN
D-2	FIRST FLOOR DEMOLITION PLAN
D-3	SECOND FLOOR DEMOLITION PLAN
A-1	BASEMENT AND FIRST FLOOR PLANS
A-2	SECOND FLOOR PLAN AND DETAILS
A-2A	REFLECTED CEILINGN PLANS
A-3	BUILDING SECTION
A-4	TOILET ROOM FLOOR PLANS AND ELEVATIONS
A-5	TOILET ROOM FLOOR PLANS AND ELEVATIONS
A-6	TOILET ROOM FLOOR PLANS AND ELEVATIONS
A-7	TOILET ROOM FLOOR PLANS AND ELEVATIONS
A-8	TOILET ROOM FLOOR PLANS AND ELEVATIONS
A-9	COUNTER DETAILS
A-10	DOOR SCHEDULE AND DETAILS
A-11	ROOM SCHEDULE AND DETAILS
A-12	BASEMENT DIMENSIONS PLAN
A-13	FIRST FLOOR DIMENSIONS PLAN
A-14	SECOND FLOOR DIMENSIONS PLAN
S-1.1	GENERAL NOTES AND DETAILS
S-2.1	FOUNDATION AND FIRST FLOOR FRAMING PLANS
S-2.2	SECOND FLOOR AND ROOF FRAMING PLANS
ECS	ELECTRICAL COVER SHEET
E-1.0	BASEMENT PLAN, LIGHTING, POWER, AND SYSTEMS
E-1.1	FIRST FLOOR PLAN, LIGHTING, POWER, AND SYSTEMS
E-1.2	SECOND FLOOR PLAN, LIGHTING, POWER, AND SYSTEMS
E-2.0	SINGLE LINE DIAGRAM AND DETAILS
E-2.1	PANEL SCHEDULES
E-2.2	DETAILS
M-1.0	MECHANICAL COVER SHEET
M-2.0	MECHANICAL FLOOR PLANS
M-2.1	MECHANICAL FLOOR PLAN
M-3.0	MECHANICAL SCHEDULES AND DETAILS
M-4.0	MECHANICAL DETAILS
P-1.0	PLUMBING COVER SHEET
P-2.0	PLUMBING FLOOR PLANS, WASTE AND VENT
P-2.1	PLUMBING FLOOR PLANS, WASTE AND VENT
P-2.2	PLUMBING FLOOR PLANS, WATER AND GAS
P-2.3	PLUMBING FLOOR PLANS, WATER AND GAS
P-3.1	DOMESTIC WATER GAS PIPING RISER DIAGRAMS
	END OF SECTION

## **AGREEMENT FORM**

1. Owner-Contractor Agreement Form: Contractor to refer to the County's standard form of agreement.

**END OF SECTION**

## DEFINITIONS

For the purposes of these specifications, and the accompanying drawings, the following definitions shall apply. This listing of definitions is not intended to be all-inclusive, but rather a clarification of several terms which are commonly used within these documents to describe the contractor's responsibilities under this contract. All other terms shall be defined by the current edition of Webster's unabridged dictionary, and, where appropriate, the best standards of the construction industry.

- 1.1 ALLOWANCE - Final scope for a certain item will be made in the future by the Owner. The Contractor is to include a specified amount of funds in the base contract to cover each identified task in the base bid. Expenditure of Allowance funds shall be substantiated by paid invoices or other means prior to being approved for payment. Unspent Allowance funds shall be credited back to the Owner.
- 1.2 BID ALTERNATE - A specifically stated portion of the work which is to be bid separately from the base bid, and which the owner may, at their sole discretion, decide to accept or reject in order to meet budgetary requirements. A *bid alternate* will be an "Add Alternate" describing work which would result in a more costly project.
- 1.3 BUILDER'S OPTION - Where an alternative material/method may be identified as equally satisfactory, a *builder's option* may be stated, which allows the contractor to choose among the stated alternatives in order to achieve the best price for the work. The Contractor shall identify which method will be utilized, and remain consistent throughout the project. No change orders shall be awarded if a contractor elects to use the more costly material/method available from the stated *builder's option(s)*.
- 1.4 UNIT PRICE - Due to the undefined nature of certain aspects of the work (especially so in renovation projects where it is likely that concealed conditions will exist which will have an impact on the scope of repair work), the Owner may request *Unit prices* in order to predetermine the costs associated with specific products or activities of the Contractor. *Unit prices* will be established for selected items and/or specific improvements and will be referred to as the basis of approval for any change orders requested, where applicable. A list of *unit prices* will be provided to each subcontractor by the Owner, as applicable for their trade(s), and the costs will be negotiated prior to commencement of the work.

END OF SECTION

## **GENERAL CONDITIONS**

1. General Conditions: AIA A201, General Conditions of the Contract for Construction. Refer to Appendix A201 as amended and as included as an appendix to these specifications.

**END OF SECTION**

## SUMMARY OF WORK

### PART 1 - GENERAL

#### 1.1 SUMMARY

##### A. Section Includes:

1. General Notes.
2. Work covered by Contract Documents.
3. Contractor use of premises.
4. Occupancy requirements.

#### 1.2 GENERAL NOTES

Project Name: Renovation and Modernization | Regan Building, Blackwood, Camden County, New Jersey

Project Number: CCIA2020-2

Location: 508 Lakeland Road, Blackwood, New Jersey 08012

Existing masonry building, 2-story plus basement, approximately 4,400 sf per floor, sloped shingle roof with 2-stop elevator. No site work, or elevator work is in this scope of Work.

Renovation and Modernization will consist of the following:

Limited demolition on each of the three building levels will be required. Basement has been demolished to expose wall framing, first floor framing, plumbing, mechanical, and electrical infrastructure; all plumbing and mechanical fixtures have been removed; light fixtures are in place and will be demolished under this Work. First floor has been demolished to expose second floor framing and some areas of plywood subfloor, all interior doors and frames have been removed, all plumbing fixtures have been removed, light fixtures are in place and will be demolished under this work. Second floor has been demolished to expose some attic floor framing and some areas of plywood subfloor; all interior doors and frames have been removed, all plumbing fixtures have been removed, light fixtures are in place and will be demolished under this Work.

New work includes new whole- building HVAC system consisting of several new gas fire furnaces and condensing units with ducted delivery throughout all three floors of the building; modifications to the electrical system including a new sub-panel, new circuits, new electrical devices and lighting; modified plumbing system including new water heater, some new domestic lines, new plumbing fixtures, new under slab sanitary lines, new vents-through-roof. Existing water, gas, and electrical services will remain. Work will include new wood framed walls, finished and painted gwb, suspended ceiling grid, gwb ceiling, porcelain tile bathrooms and showers, interior doors and frames, new aluminum entry door. All materials shall be provided and installed in the manner described in the plans and specifications or according to industry best practices.

Bidder is made aware that work under this bid will be concurrent with work being performed under a separate contract which will be awarded at the same time as this bid. Bidder responsible to coordinate activities on site and in the building with all other contractors authorized to work on the site.

- A. This project is subject to the provisions of the New Jersey Uniform Construction Code [N.J.A.C. 5:23]. The Contractor shall verify all code requirements and bring any discrepancies between code requirements and the construction documents to the attention of the Architect prior to commencing with construction.
- B. It is the Contractor's responsibility to inspect and assess the project and to fulfill the intent of the work indicated by the contract documents. Contractor shall verify all conditions and dimensions within the contract limits. Deviations from the contract documents necessitated by field conditions shall be brought to the attention of the Architect.
- C. Contractor shall bring errors and omissions which may occur in contract documents to the attention of the Architect and instructions shall be obtained from the Architect before proceeding with affected work. The Contractor will be held responsible for the results of any errors, discrepancies, or omissions in the contract documents which can readily or reasonably be determined and for which the Contractor failed to notify the Architect before construction and/or fabrication of subject work.
- D. Details and sections on the drawings are taken at specific locations and are intended to serve as typical construction for all similar conditions. Modifications shall be made by Contractor to accommodate minor variations.
- E. Do not scale the drawings. Refer to written text and dimensions for information. The Contractor and Sub-Contractor shall verify all dimensions and job conditions at the job site sufficiently in advance of work to be performed to assure the orderly progress of the work.
- F. All dimensions are to face of GWB and face of block unless noted otherwise drawings.
- G. The Contractor shall make no structural changes without written approval of the Architect. Contractor shall insure safety and stability of structure(s) at all times during the construction period.
- H. The Contractor shall limit the use of the premises to the areas indicated. Portions of the site beyond areas on which work is indicated are not to be disturbed. The Contractor shall maintain the premises clean and free of all trash, debris and shall protect all adjacent work from damage, soiling, paint overspray, etc. All fixtures, equipment, glazing, floors, etc., shall be left clean and remain ready for occupancy throughout the duration of the project.
- I. Do not unreasonably encumber the work area with materials or equipment. Confine stockpiling of materials to the areas approved by the Owner. If additional storage is necessary, obtain and pay for such storage off site. Maintain the site in a clean and sanitary condition.

- J. Contractor to provide temporary protection to prevent unauthorized entry to construction areas and to protect existing facilities and adjacent spaces from damage.
- K. Contractor to keep project area clean and free of debris. Contractor shall maintain a supply of hardhats for use by visitors to the site and enforce the use thereof.
- L. The Contractor shall monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce work of specified quality. Comply fully with manufacturers' instructions. Protect installed work and provide special protection where specified in individual specification Sections.
- M. All applicable local, state and federal regulations shall be met for handicap accessible buildings.
- N. The Contractor shall review the Contract Drawings and Specifications for other items of work required to provide a complete project and shall provide them in his Total Price Bid so as to impose no additional cost to the Owner for the completion of this project.
- O. The Contractor shall be responsible for obtaining all necessary local approvals, permits, registrations and/or certifications and construction. The Contractor must follow and comply with all applicable requirements and standards as required under the approvals, permits, registrations and/or certifications and construction permits obtained for this project. Also, reference the "Supplementary Conditions" for additional permit requirements.
- P. The Owner and its Architect shall not be responsible for job safety. The Contractor shall be responsible for all job safety requirements for his employees and sub-contractors in the performance or the work under this project.
- Q. The Contractor shall supply, place, and maintain at all times during the term of the Contract such safety equipment and procedures as are required for protection of persons and property.
- R. The Contractor is responsible for all lines, elevations, and measurements, exercising precaution to verify all dimensions shown on the Contract Drawings.
- S. The Contractor shall be responsible for surface restoration work as required to complete the installation and restore all areas affected due to the performance of the work under this contract. All affected areas shall be left in the same or in a condition better than existed before the start of construction or as shown on the Contract Drawings.

### 1.3 WORK COVERED BY CONTRACT DOCUMENTS – BASE BID & ADD/ALTERNATES

- A. Provide and pay for all labor, superintendence, materials, tools, transportation, services, licenses, taxes, equipment and all means of construction necessary and reasonably incidental to the completion of the improvements required for the

“Renovation and Modernization | Regan Building”, in Blackwood, New Jersey as specified herein and as shown on the Contract Drawings.

B. All materials and labor obviously a part of the work, and as necessary for proper installation and/or operation of same, although not specifically indicated on the Contract Drawings and/or in the Specifications shall be provided by the Contractor as if called in detail without additional cost to the Owner.

C. The work for this project under the Base Bid includes the following:

1. The preparation of an existing building for construction of new interior building improvements.
2. The work includes, but is not limited to: building demolition, concrete slab, cmu and framed walls, wall, ceiling, and floor finishes as indicated, lighting, doors and hardware, low voltage door entry system, lighting, power and outlets, fire alarm system, HVAC system, plumbing system, safety devices.
3. Without intending to limit or restrict the amount of work included and solely for the convenience of the Contractor, the major items of work included shall comprise the following:
  - i. Building demolition, limited masonry and concrete.
  - ii. New interior walls, partitions and doors, ceilings and, MEP infrastructure as indicated and required.
  - iii. Complete finish of all building and site elements including floor, wall, and ceiling finishes, envelope components, cladding and lighting, and any other items required for a complete project, and other items shown and/or listed on the attached contract drawings. Installation shall include all labor required by the manufacturer to provide a completed project as described on the attached contract drawings. All final dimensions shall be confirmed by the Contractor in the field prior to beginning construction.



#### 1.4 CONTRACTOR USE OF PREMISES

##### A. Limit use of the premises to construction activities in areas indicated.

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. Contractor to secure and protect work area from rest of the facility for dust and noise control.
3. Contractor to coordinate work under this bid with other work being performed at the project location to maintain access and project schedules throughout duration of the work under this bid.

END OF SECTION

## SECTION 012000

### MEASUREMENT AND PAYMENT

#### PART 1 - GENERAL

##### 1.1 BID/PAY ITEMS / SCHEDULE OF VALUES

- A. All payments or credits shall be made on the basis of the TOTAL PRICE BID by the Contractor. The Contractor shall submit a detailed and balanced schedule of values. Following the acceptance of the schedule of values by the Owner, progress payments may be requested based on the approved schedule.
- B. The Contractor shall prepare his schedule of values so that it reflects the actual costs which the bidder anticipates the performance of work under each item delineated so that the item includes all costs associated with the bidders anticipated profit, overhead and costs to perform the work.
- C. The Owner may increase or decrease the quantity of work to be done under any item and that the Contractor will only be paid for actual quantity of work provided based on the prices delineated under the Owner approved schedule of values.
- D. The schedule of values will be considered materially unbalanced when it is based on prices significantly less than cost for some work and prices which are significantly overstated for other work.
- E. No progress payments will be made for Lump Sum items for which the Contractor has not included a price breakdown in the Owner approved schedule of values.
- F. Measurement for partial payments will be made by the Architect and will be based on the work that the Architect considers complete, and the assigned values in the Owner approved schedule of values. The Architect shall be the sole judge of the percentage of completion of a Lump Sum item.
- G. Individual schedule of value items will not be considered complete until installation and testing are complete and the item is placed in service, or in the Architect's judgment is available to be placed in service.

##### 1.2 PROGRESS PAYMENTS (PARTIAL PAYMENTS)

- A. Progress payments for the approved and measured quantities of an item will be subject to the retainage as set forth in the General conditions.
  - 1. Progress payments approved for temporary measures are made based on the temporary measure being maintained by the Contractor until replaced by permanent measures or until no longer required and the Contractor is directed by the Architect to remove the temporary measure.
  - 2. When in the opinion of the Architect, the Contractor is not maintaining the temporary measure, the Contractor shall be so notified by the Architect.

3. Following notice to the Contractor the Architect will increase retainage on Contractors future application or applications for progress payments in an amount equal to or exceeding that previously approved for the temporary measures that are not being maintained by the Contractor.

#### 1.4 MEASUREMENT OF QUANTITIES

- A. The Architect shall be the sole judge of the completeness of the work as well as the quantity of the item installed in the work.
- B. Completed work shall be measured for payment by the Contractor. The measurement shall be performed in the presence of the Architect. The measurement shall be certified by the Contractor and witnessed by the Architect.
- C. Method of measurements shall be as delineated on the Owner approved schedule of values.
- D. The day the measurement is performed the Contractor shall provide to the Architect one copy of the certified and witnessed measurements.
- E. Contractors application for payment shall be accompanied by certified and witnessed measurement records covering all work for which payment is requested.

#### 1.5 CREDITS

- A. No payments will be made for items or quantities of items not installed in the work. The Contractor will be paid only for work and materials that are installed and accepted.

#### 1.6 WORK INCLUDED IN PRICE BID

- A. The total price bid by the Contractor shall include all labor (based on NJ Prevailing Wages), superintendence, materials, tools, transportation, plant and equipment, overhead and profit, and all means of construction necessary and reasonably incidental to the complete and fully operational "Renovation and Modernization | Regan Building" in accordance with the Contract Documents. No additional or separate payments will be allowed under this contract.
- B. All materials and labor obviously a part of the work, and as necessary for proper installation and/or operation of same, although not specifically indicated on the Contract Drawings and/or in the Specifications shall be provided by the Contractor as if called out in detail without additional cost to the Owner and shall be considered to be included in the total price bid by the Contractor.
- C. Measurement and payment will be made in accordance with the approved schedule of values for work and materials that are installed and accepted by the Architect.

END OF SECTION

## **SUBMITTAL PROCEDURES**

### **PART 1 - GENERAL**

#### **1.1 SECTION INCLUDES**

- A. Section Includes:
  - 1. Submittal procedures.
  - 2. Product Data, Shop Drawings, and Samples.
  - 3. Assurance/Control submittals.
    - a. Certificates.
    - b. Manufacturer's installation instructions.
  - 4. Architect's action.

#### **1.2 SUBMITTALS**

- A. Submit two copies of proposed Schedule of Submittals to Architect within 30 days after receipt of Notice to Proceed. List all items require submittal for review and approval by Architect. Utilize Submittal Schedule, AIA Document G712, or other approved format.
- B. Schedule of Submittals: Include the following.
  - 1. Indicate type of submittal; product data, shop drawing, sample, certificate, or other submittal.
  - 2. Identify by Plan and/or Detail number where item is specified, and description of item being submitted.
  - 3. Indicate scheduled date for initial submittal.
- C. Coordinate Schedule of Submittals with Construction Schedule. Revise and update Schedule of Submittals when required by changes in the Construction Schedule. Provide Architect with updated schedules within 2 days of date schedule is revised.

#### **1.3 SUBMITTAL PROCEDURES**

- A. Transmit each submittal with Architect accepted form. Submit the number of opaque reproductions which the Contractor requires, plus two (2) copies which shall be retained by the Architect.
- B. Identify Project, Contractor, Subcontractor or supplier; pertinent drawing and detail number, and specification section number, as appropriate.

- C. Apply Contractor's stamp, signed or initialed certifying that review, verification of Products required, field dimensions, adjacent construction Work, and coordination of information, is in accordance with the requirements of the Work and Contract Documents.
- D. For each submittal for review, allow 10 days excluding delivery time to and from the Contractor.
- E. Revise and resubmit when required, identify all changes made since previous submission.

#### 1.4 PRODUCT DATA

- A. Product data includes printed information such as catalog cuts, manufacturer's published instructions, standard color charts, roughing-in diagrams and templates, standard wiring diagrams, performance curves and other similar items.
- B. Submit the number of copies which the Contractor requires, plus two copies which will be retained by Architect.
- C. Mark each copy to identify applicable products, models, options, and other data. Submissions which do not specifically indicate the products being used from among multiple products shown will be rejected without review for resubmittal. Supplement manufacturers' standard data to provide information unique to this Project.

#### 1.5 SHOP DRAWINGS

- A. Submit in the form of one reproducible transparency and one opaque reproduction.
- B. Shop Drawings: Submit for review. After review, produce copies and distribute in accordance with the SUBMITTAL PROCEDURES article above.
- C. Indicate special utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

#### 1.6 SAMPLES

- A. Submit samples to illustrate functional and aesthetic characteristics of the Product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
- B. Submit samples of finishes in colors selected, textures, and patterns for Architect selection.
- C. Include identification on each sample, with full Project information.

- D. Submit four (4) samples; one of which will be retained by the Architect, minimum of three (3) sets.

## 1.7 CERTIFICATES

- A. When specified on the Construction Drawings or requested by the Owner, submit certification by manufacturer to Architect, in quantities specified for Product Data.
- B. Indicate material or Product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
- C. Certificates may be recent or previous test results on material or Product, but must be acceptable to Architect.

## 1.8 MANUFACTURER INSTALLATION INSTRUCTIONS

- A. When specified on the Construction Drawings, submit printed instructions for delivery, storage, assembly, installation, adjusting, and finishing, to Architect in quantities specified for Product Data.
- B. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

## 1.9 ARCHITECT ACTION

- A. For submittals where action and return is required or requested, Architect will review each submittal, mark to indicate action taken, and return promptly; generally within 10 calendar days from date of receipt.
  - 1. Compliance with specified characteristics is the Contractor's responsibility.
  - 2. Submittals for information, closeout documents, record documents and other submittals for similar purposes, no action will be taken.
- B. Action Stamp: Architect will stamp each submittal with a uniform, self-explanatory action stamp. The stamp will be appropriately marked, as follows, to indicate the action taken.
  - 1. "No Exceptions Taken": Final Unrestricted Release. Where submittals are marked "No Exceptions Taken", that part of the Work covered by the submittal may proceed provided it complies with requirements of the Contract Documents; final acceptance will depend upon that compliance.
  - 2. "Approved as Noted": Final-But-Restricted Release. When submittals are marked "Approved as Noted", that part of the Work covered by the submittal may proceed provided it complies with notations or corrections on the submittal and requirements of the Contract Documents; final acceptance will depend on that compliance.

3. "Rejected" or "Resubmit": Returned for Resubmittal. When submittal is marked "Rejected" or "Resubmit," do not proceed with that part of the Work covered by the submittal, including purchasing, fabrication, delivery, or other activity. Revise or prepare a new submittal in accordance with the notations; resubmit without delay. Repeat if necessary to obtain a different action mark.
4. Where a submittal is primarily for information or record purposes, special processing or other activity, the submittal will be retained for the Architect's reference purposes and/or discarded. No return to the Contractor will occur.

END OF SECTION

## **PROJECT MANAGEMENT AND COORDINATION**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

**A. Section Includes:**

1. Administrative and supervisory personnel.
2. Submittals.
3. Contractor quality control.
4. Coordination.
5. Project coordination.
6. Preconstruction meeting.
7. Progress meetings.
8. Progress Reports.
9. Pre-installation meetings.
10. Schedule of Values.
11. Application for Payment.
12. Change Procedures.

#### **1.2 ADMINISTRATIVE AND SUPERVISORY PERSONNEL**

- A. Project Manager/Administrator:** Contractor Representative experienced in administration, supervision, and quality control of building expansion and alteration construction, similar to Work of this Project, including electrical work.
- B. Project Field Superintendent:** Contractor Representative experienced in general field supervision of building construction, similar to Work of this Project, including electrical work, to supervise, direct, inspect and coordinate Work of Contractor, subcontractors, suppliers and installers, and expedite Work to assure compliance with Construction Schedules. Project Field Superintendent shall be a full-time on-site job assignment.

#### **1.3 SUBMITTALS**

- A.** Submit shop drawings, product data, samples, and other required submittals, in accordance with Section 013000 - Submittal Procedures, for review and compliance with Contract Documents, and for conformance to field dimensions and clearances.
- B.** Submit Requests for Information and interpretation of Contract Documents in a timely manner and obtain replies from Architect prior to proceeding with the work in question.
- C.** Submit schedule of values not less than seven (7) days prior to first payment request. Submit "pencil copy" of proposed Payment Application (fax or email is acceptable) not less than 96 hours prior to the scheduled site meeting at which the Payment Application is to be presented.



#### 1.4 CONTRACTOR QUALITY CONTROL

- A. Coordinate all program activities through the representatives of the local utility companies, or their assigned agents as required.
- B. Coordinate scheduling of inspection and testing required by individual specification Sections and in accordance with Section 014000 - Quality Control.
- C. Coordinate schedule for testing to be performed by the Owner under separate contract.

#### 1.5 COORDINATION DRAWINGS

- A. Prepare and distribute coordination drawings where close coordination is required for installation of Products and materials fabricated off-site by separate entities, and where limited space availability requires maximum utilization of space for efficient installation of different components. Show interrelationship of components shown on separate shop drawings. Indicate required installation sequences.

#### 1.6 PROJECT COORDINATION

- A. Coordinate construction activities and work of all trades under the construction documents and Work of Contract to facilitate orderly installation of each part of Work. Coordinate construction operations included under the construction documents and Contract that are dependent upon each other for proper installation, connection, and operation.
- B. Where installation of one part of Work is dependent on installation of other components, either before or after that part of Work, schedule construction activities in sequence required to obtain uninterrupted installation.
- C. Obtain drawings, manufacturer's product data, instructions, and other data to provide a complete and proper installation.
  - 1. Check field dimensions prior to installing products. Verify necessary clearances and means of access from equipment storage to final position.
  - 2. Make data and information available to trades involved.
- D. Ensure that utility requirements for the installation of service laterals, meter locations, etc. are compatible current regulations.
- G. Where necessary, prepare memoranda for distribution to each party involved outlining special procedures required for coordination.
- H. After Owner occupancy of Project, coordinate access to project for correction of defective Work and Work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

#### 1.7 PRE-CONSTRUCTION MEETING

- A. Owner and Architect will schedule a meeting after Notice of Award.
- B. Attendance: Owner, Architect, Contractor, Project Superintendent, and Contractor Quality Control Representative, plus others at the invitation of the Owner.
- C. Agenda:
  - 1. Submission of executed bonds and insurance certificates.
  - 2. Distribution of Contract Documents.
  - 3. Submission of schedule of values.
  - 4. Designation of personnel representing the parties in Contract.
  - 5. Procedures and processing of Requests for Information, field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and contract closeout procedures.
  - 6. Scheduling.
  - 7. Review of any special conditions or requirements for interim inspections.
  - 8. Construction facilities and temporary controls.
- D. Architect or authorized representative will record minutes and distribute copies to participants, and those affected by decisions made.

#### 1.8 PROGRESS MEETINGS

- A. Architect or authorized representative will schedule and administer meetings throughout progress of Work at intervals as agreed upon by the Owner, Architect and Contractor.
- B. Architect or authorized representative will make arrangements for meetings, prepare agenda with copies for participants and preside at meetings.
- C. Attendance: Job Superintendent, Contractor Quality Control Representative, major Subcontractors and suppliers, and Architect as appropriate to agenda topics for each meeting.
- D. Architect or authorized representative will record minutes and distribute copies to participants, and those affected by decisions made.

#### 1.9 PROGRESS REPORTS

- A. Construction Progress Schedules
  - 1. Submit initial progress schedule in duplicate within 15 days after "Commencement of Work" for Owner/Architect review.
  - 2. Submit revised schedules with each Application for Payment, identifying changes since previous version. Indicate estimated percentage of completion for each item of Work at each submission.

3. Submit a horizontal bar chart with separate line for each section of Work, identifying first work date of each week.

#### 1.10 SCHEDULE OF VALUES

- A. Submit a construction cost breakdown after contract award to the Architect using AIA Form G703, or other approved format. Contractor may be required to utilize established formats as may be required by entities providing funding for the project.

#### 1.11 APPLICATION FOR PAYMENT

- A. Submit five (5) original copies of each application in the prescribed format for review, signature & processing at the Project Meeting assigned for that purpose. Submit "pencil copy" of proposed Payment Application (fax or email is acceptable) not less than 96 hours prior to the scheduled site meeting at which the Payment Application is to be presented.
- B. Content and Format: Utilize Schedule of Values for listing items in Application for Payment.
- C. Payment Period: Monthly.
- D. Following completion of the following requirements, final payment request may be submitted:
  1. Complete work listed as incomplete at time of substantial completion, or otherwise assure Owner of subsequent completion of individual incomplete items.
  2. Settle liens and other claims, or assure Owner of subsequent settlement.
  3. Submit proof of payment on fees, taxes and similar obligations.
  4. Transfer operational, access, security and similar provisions to Owner; and remove temporary facilities, tools and similar items.
  5. Completion of requirements specified in "Project Closeout" section.
  6. Obtain consent of surety for final payment.

#### 1.12 CHANGE PROCEDURES

- A. Submit backup materials and costs associated with any proposed Change Order to the Owner & Architect for review. DO NOT proceed with any work for which a

Change Order is necessary without written approval to do so. Failure to obtain written approval may void Contractor's claim associated with the changed work, or the acceptance thereof.

- B. Change Procedures: Change Order Forms - AIA G701 or other approved format.

END OF SECTION

## QUALITY CONTROL

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
  - 2. Quality control procedures.
  - 3. Contractor's testing and inspection reports.
  - 4. Non-compliance check-off list.
  - 5. Completion and inspection of Work.
  - 6. Field samples.

#### 1.2 QUALITY CONTROL PROCEDURES

- A. Monitor quality control over Contractor staff, subcontractors, suppliers, manufacturer's, products, services, site conditions, and workmanship.
- B. Comply fully with manufacturer's published instructions, including each step in sequence of installation.
- C. Should manufacturer's published instructions conflict with Contract Documents, request clarification from Architect before proceeding.
- D. Comply with specified standards as a minimum quality for Work, except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. Perform Work by persons who are thoroughly qualified and trained in their respective trade, to produce workmanship of specified quality.
- F. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.
- G. Perform tests required by governing authorities having jurisdiction and utilities having jurisdiction.

#### 1.3 CONTRACTOR FIELD INSPECTION AND TESTING

- A. Contractor: Test and Inspect Work provided under this Contract to ensure Work is in compliance with Contract requirements.
- B. Preparatory Inspection: Performed prior to beginning Work and prior to beginning each segment of Work and includes:

- C. Initial Inspection: Performed when representative portion of each segment of Work is completed and includes:
  - 1. Performance of required tests.
  - 2. Quality of workmanship.
  - 3. Review for omissions or dimensional errors.
  - 4. Examination of products used, connections and supports.
  - 5. Approval or rejection of inspected segment of Work.
- D. Follow-Up Inspections: Performed daily, and more frequently as necessary, to assure non-complying Work has been corrected.
- E. Testing and Inspection: Perform testing and inspection in accordance with Owner's and/or Municipal requirements.

#### 1.5 CONTRACTOR'S TEST AND INSPECTION REPORTS

- A. Prepare and submit, to Architect, a written report of each test or inspection signed by Contractor Quality Control Representative performing inspection within 2 days following day inspection was made.
- B. Include the following on written reports of inspection:
  - 1. Cover sheet prominently identifying that inspection "CONFORMS" or "DOES NOT CONFORM" to Contract Documents.
  - 2. Date of inspection and date of report.
  - 3. Project name, location, solicitation number, and Contractor.
  - 4. Names and titles of individuals making inspection, if not Contractor's Project Field Superintendent.
  - 5. Description of Contract requirements for inspection by referencing Specification Section.
  - 6. Description of inspection made, interpretation of inspection results, and notification of significant conditions at time of inspection.
  - 7. Requirements for follow-up inspections.

#### 1.6 NON-COMPLIANCE CHECK-OFF LIST

- A. Maintain check-off list of Work that does not comply with Contract Documents, stating specifically what is non-complying, date faulty Work was originally discovered, and date Work was corrected. No requirement to report deficiencies

corrected same day it was discovered. Submit copy of Non-Compliance Check-Off List of non-complying work items to Architect on a weekly basis.

#### 1.7 COMPLETION AND INSPECTION OF WORK

- A. Prior to final acceptance by Architect, submit a certification signed by Contractor to Architect stating that all Work has been inspected and all Work, except as specifically noted, is complete and in compliance with Contract Documents.
- B. Record Documents: By Contractor Quality Control Representative. Ensure that "As-Builts" required by Section 017001 - Closeout Submittals, are marked to show any deviations which have been made during the course of construction and are kept current on a daily basis. Upon completion of the Work, certify the accuracy of the "As-Builts" and submit to Architect.

#### 1.8 FIELD SAMPLES

- A. Construct field samples at the site for review as requested by the Owner or Owner's representative. Acceptable samples represent a quality level for work. Field samples shall remain in place until subject project work is completed and accepted.

END OF SECTION

## **MATERIAL / MANUFACTURER SUBSTITUTION POLICY**

### **PART 1 - GENERAL**

#### **1.1 MATERIALS AND EQUIPMENT**

##### **A. Products:**

1. Products: Means new material, machinery components, equipment, fixtures, and systems forming the Work but does not include machinery and equipment used for preparation, fabrication, conveying and erection of the Work. Products may also include existing materials or components specifically identified for reuse.
2. Use interchangeable components of the same manufacture for similar components.

##### **B. Product Options:**

1. Products specified by Reference Standards or by Description Only: Any product meeting those standards or description and approved by the Architect.
2. Products specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named by the Architect.

#### **1.2 SUBSTITUTION POLICY**

- A. Contractor must take note that certain provisions within the drawings for these projects have been designed to utilize a specific product(s) available only through the designated manufacturer(s). The products and materials specified in this manner have been identified by the Owner and/or the Architect as the "basis of design" for the project(s), and may not be substituted unless specifically agreed to in writing by the Owner and/or the Architect. This policy will be strictly adhered to in order to maintain uniform appearance, function, and maintenance considerations for the project.
- B. If a specified product or material is no longer available, or a substitution is desired for other reasons, for items specified as a specific model number, color, and/or manufacturer, the proposed product will be required to be equivalent in every respect to the item specified. The criteria for approval as an "equivalent" shall include, but not be limited to, performance, dimension, appearance, finish, warranty, and/or the interchangeability of replacement parts with the product originally specified.
- C. Proposed substitutions shall be submitted to the Architect in writing, including detailed shop drawings and product data for the proposed product, as applicable.

**END OF SECTION**



## EXECUTION REQUIREMENTS

### 1.1 SUMMARY

#### A. Section Includes:

1. Installation.
2. Cleaning.
3. Starting and adjusting.

#### B. Installation:

1. Refer to installation requirements included on the drawings or indicated in the manufacturers written specifications.
2. For each Product, inspect substrate and conditions under which the Work will be performed. Do not proceed until unsatisfactory conditions have been corrected.
3. Comply with manufacturer's published installation instructions and recommendations, to extent that instructions and recommendations are more explicit or stringent than requirements in Contract Documents.
4. Inspect Products immediately upon delivery to Project Site ready for installation.
  - a. Inspect Products immediately before start of application, installation, or erection.
  - b. Reject damaged and defective Products.
5. Verify and check dimensions and measurements before start of installation or erection.
6. Coordinate closing-in of Work with required inspections and tests.
  - a. Do not cover Work until inspected and approved by appropriate person or entity.
7. Provide fasteners, attachments, connection devices, and methods as indicated on Drawings or as specified.
  - a. Where not indicated or specified provide appropriate methods necessary for securing Work.
  - b. Secure Work plumb, true to line and level.
  - c. Provide for expansion and building movement.

### 1.2 CLEANING

- A. Cleaning During Construction: Maintain the project site as clean as practicable throughout construction period, including the removal of debris, trash, etc.
- B. Final Cleaning:
  - 1. Use cleaning materials and agents recommended by manufacturer or fabricator of surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property, or that might damage finished surfaces.
  - 2. Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit of Work to condition expected from a commercial building cleaning and maintenance program. Comply with manufacturer's published instructions.
  - 3. Complete following cleaning operations before requesting Punchlist inspection for Substantial Completion of Project by Architect. Project shall be "move-in" ready for Punchlist inspection.
    - a. Clean Project Site, yard and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste materials, litter and foreign substances. Sweep paved areas broom clean. Remove petro-chemical spills, stains and other foreign deposits. Rake grounds that are neither planted nor paved, to a smooth even-textured surface.
    - b. Remove tools, construction equipment, machinery and surplus material from Project Site.
    - c. Remove snow and ice to provide safe access to building.
    - d. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
    - e. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics and similar spaces.
    - g. Vacuum clean carpet and similar soft surfaces, removing debris and excess nap. Shampoo if required.
    - h. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other substances that are noticeable vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.
    - i. Remove labels that are not permanent labels.

- j. Touch-up and otherwise repair and restore marred exposed finishes and surfaces. Replace finishes and surfaces that can not be satisfactorily repaired or restored, or that show evidence of repair or restoration. Do not paint over "UL" and similar labels, including mechanical and electrical name plates.
  - k. Wipe surfaces of mechanical and electrical equipment, and other similar equipment. Remove excess lubrication, paint and mortar droppings and other foreign substances.
  - l. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
  - m. Replace air disposable filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills. Clean ducts, blowers, and coils if units were operated without filters during construction.
  - n. Clean light fixtures, lamps, globes and reflectors to function with full efficiency. Replace any burned out bulbs, and defective and noisy starters in fluorescent and mercury vapor fixtures.
  - o. Leave Project clean and ready for occupancy.
4. Comply with governing regulations and safety standards for cleaning operations. Remove waste materials from Project Site and dispose of in accordance with requirements of local authorities having jurisdiction.

### 1.3 STARTING AND ADJUSTING

#### A. Starting Systems:

- 1. Coordinate schedule for start-up of various equipment and systems.
- 2. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions which may cause damage.
- 3. Verify tests, meter readings, and specified electrical characteristics agree with those required by equipment or system manufacturer.
- 4. Verify wiring and support components for equipment are complete and tested.
- 5. Execute start-up under supervision of applicable Contractors' personnel in accordance with manufacturers' instructions.
- 6. When specified in individual specification Sections, require manufacturer to provide authorized representative be present at Project Site to inspect, check, and approve equipment or system installation prior to start-up, and to supervise placing equipment or system in operation.

B. Demonstration and Instruction:

1. Demonstrate operation and maintenance of Products to Owner's personnel 2 weeks before Date of Final Acceptance.
2. Demonstrate Project equipment and provide operation instruction by qualified installer representative who is knowledgeable about Project.
3. Utilize operation and maintenance manuals as basis for instruction. Review contents of manual with Owner's personnel in detail to explain all aspects of operation and maintenance.

END OF SECTION

## **CLOSE-OUT SUBMITTALS**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

**A. Section Includes:**

1. Operation and Maintenance manuals.
2. Product warranties.
3. "Record As-Built Drawings".

#### **1.2 OPERATION AND MAINTENANCE MANUALS**

**A. Prepare instructions and data by personnel experienced in maintenance and operation of described products.**

1. Prepare data in the form of an instructional manual.
2. Binders: Commercial quality, 8-1/2 x 11 inch three D side ring binders with durable plastic covers; 2 inch maximum ring size. When multiple binders are used, correlate data into related consistent groupings.
3. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of Project; identify subject matter of contents.
4. Provide tabbed dividers for each separate product and system, with typed description of product and major component parts of equipment.
5. Text: Manufacturer's published data, or typewritten data on 20 pound paper.
6. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.
7. Contents: Prepare a Table of Contents for each volume, with each Product or system description identified, in three parts as follows:
  - a. Part 1: Directory, listing names, addresses, and telephone numbers of Architect, Contractor, Subcontractors, and major equipment suppliers.
  - b. Part 2: Operation and maintenance instructions, arranged by system and subdivided by specification Section. For each category, identify names, addresses, and telephone numbers of Subcontractors and suppliers. Identify the following:
    - 1) Significant design criteria.

- 2) List of equipment.
  - 3) Parts list for each component.
  - 4) Operating instructions.
  - 5) Maintenance instructions for equipment and systems.
  - 6) Maintenance instructions for special finishes, including recommended cleaning methods and materials, and special precautions identifying detrimental agents.
- c. Part 3: Project documents and certificates, including the following:
- 1) Shop drawings and product data.
  - 2) Certificates.
  - 3) Photocopies of warranties.

### 1.3 PRODUCT WARRANTIES

- A. Submit Warranties required for specific Products or Work as specified in each individual Section.
- B. List of Minimum Required Warranties and Guarantees (where applicable):
1. General Contractor - One (2) two guarantee for all labor and materials for the entire project.
  2. HVAC Contractor - One (2) two guarantee for all labor and materials and manufacturer's standard guarantees for equipment within the scope of this contract.
  3. Electrical Contractor - One (2) two guarantee for all labor and materials, and manufacturer's standard guarantees for all equipment and fixtures within the scope of this contract.
  4. Windows and Doors - Manufacturer's standard guarantee, one (1) year minimum.
  5. Carpeting - Manufacturer's standard guarantee, one (1) year minimum for material and installation.
  6. Major Appliances - e.g., range, range hood, refrigerator, disposal, washer and dryer, thru-wall A.C. units, dishwashers, etc. - Manufacturer's standard guarantees, one (1) year minimum.
- C. Form of Submittals:

1. Bind in commercial quality 8-1/2 x 11 inch three D side ring binders with durable plastic covers.
2. Cover: Identify each binder with typed or printed title WARRANTIES with title of Project; name, address and telephone number of Contractor and equipment supplier; and name of responsible company principal.
3. Table of Contents: Neatly typed, in sequence of Table of Contents of Project Manual, with each item identified with number and title of specification Section in which specified, and name of Product or Work item.
4. Separate each warranty with index tab sheets keyed to Table of Contents listing. Provide full information, using separate typed sheets as necessary. List Subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.

D. Time of Submittals:

1. For equipment or component parts of equipment put into service during construction with Architect approval, submit documents within 10 days after acceptance.
2. Make other submittals within 10 days after Date of Final Completion, prior to final Application for Payment.
3. For items of Work for which acceptance is delayed beyond Date of Final Completion, submit within 10 days after acceptance.

1.4 "PROJECT RECORD AS-BUILT DRAWINGS"

A. Project Record Documents required include:

1. Marked-up copies of Contract Drawings.
2. Marked-up copies of Shop Drawings.
3. Marked-up copies of Contract Modifications.
4. Marked-up Product Data submittals.
5. Field records for variable and concealed conditions.
6. Record information on Work that is recorded only schematically.

B. Maintenance of Documents: Store record documents in field office apart from Contract Documents used for construction. Do not permit Project Record Documents to be used for construction purposes. Maintain and protect record documents from damage in a clean, dry, legible condition. Make documents available at all times for inspection.

C. Record Drawings:

1. During construction, maintain a set of black-line white-prints of Contract Drawings and Shop Drawings for Project Record Document purposes.
  - a. Mark these Drawings to indicate actual installation where installation varies from installation shown originally. Give particular attention to information on concealed elements which would be difficult to identify or measure and record later. Items required to be marked include but are not limited to:
    - 1) Dimensional changes to Drawings.
    - 2) Revisions to details shown on Drawings.
    - 3) Depths of foundations below first floor.
    - 4) Locations and depths of underground utilities.
    - 5) Revisions to routing of piping and conduits.
    - 6) Revisions to electrical circuitry.
    - 7) Actual equipment locations.
    - 8) Duct size and routing.
    - 9) Locations of concealed internal utilities.
    - 10) Changes made by Contract Modification.
    - 11) Details not on original Contract Drawings.
  - b. Mark completely and accurately record prints of Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions. Where Shop Drawings are marked, show cross-reference on Contract Drawings location.
  - c. Mark record sets with red erasable colored pencil; use other colors to distinguish between changes for different categories of Work at same location.
  - d. Mark important additional information which was either shown schematically or omitted from original Drawings.
  - e. Note construction change directive numbers, alternate numbers, Contract Modification numbers and similar identification.
  - f. Contractor bears full Responsibility for Markup and Supervision of the As-Built documentation throughout the course of the project. Where feasible, individual or entity who obtained record data,



whether individual or entity is installer, subcontractor, or similar entity, is required to prepare mark-up on Record Drawings.

- 1) Accurately record information in an understandable Drawing technique.
  - 2) Record data as soon as possible after it has been obtained. In case of concealed installations, record and check mark-up prior to concealment.
- g. At time of Final Acceptance, submit record Drawings to Architect for Owner's records. Organize into sets, bind and label sets for Owner's continued use.
2. Copies and Distribution: After completing preparation of Record Drawings, print 3 black-line prints of each Drawing, whether or not changes and additional information were recorded. Organize copies into manageable sets. Bind each set with durable paper cover sheets, with appropriate identification, including titles, dates and other information on cover sheets.
- a. Organize and bind original marked-up set of prints that were maintained during construction in same manner.
  - b. Organize record transparencies into sets matching print sets. Place each set in durable tube-type Drawing containers with end caps. Mark end cap of each container with suitable identification.

D. Additional Record Submittals:

1. Refer to other specification Sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities. Immediately prior to Final Acceptance, complete additional records and place in order, properly identified and bound or filed, ready for use and reference.
  - a. Categories of requirements resulting in miscellaneous records include, but are not limited to the following:
    - 1) Load and performance testing.
    - 2) Inspections and certifications by governing authorities.
    - 3) Fire resistance and flame spread test results.
    - 4) Final inspection and correction procedures.

END OF SECTION

**TECHNICAL SPECIFICATIONS**

**FOR:**

**CAMDEN COUNTY  
RENOVATION AND MODERNIZATION  
REGAN BUILDING**

508 Lakeland Road  
Blackwood, New Jersey 08012

## **SECTION 033053**

### **MISCELLANEOUS CAST-IN-PLACE CONCRETE**

#### **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 cast-in-place concrete, including reinforcement, concrete materials, mixture design, placement procedures, and finishes.

##### **1.3 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
- B. Design Mixtures: For each concrete mixture.

##### **1.4 QUALITY ASSURANCE**

- A. Ready-Mix-Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.

#### **PART 2 - PRODUCTS**

##### **2.1 CONCRETE, GENERAL**

- A. Comply with the following sections of ACI 301 (ACI 301M) unless modified by requirements in the Contract Documents:
  - 1. "General Requirements."
  - 2. "Formwork and Formwork Accessories."
  - 3. "Reinforcement and Reinforcement Supports."
  - 4. "Concrete Mixtures."
  - 5. "Handling, Placing, and Constructing."
- B. Comply with ACI 117 (ACI 117M).

## 2.2 STEEL REINFORCEMENT

- A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), deformed.
- B. Plain-Steel Wire: ASTM A 1064/A 1064M, as drawn.
- C. Plain-Steel Welded-Wire Reinforcement: ASTM A 1064/A 1064M, plain, fabricated from as-drawn steel wire into flat sheets.

## 2.3 CONCRETE MATERIALS

- A. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from single source, and obtain admixtures from single source from single manufacturer.
- B. Cementitious Materials:
  - 1. Portland Cement: ASTM C 150/C 150M, **Type I**.
- C. Normal-Weight Aggregate: ASTM C 33/C 33M, **1-1/2-inch (38-mm)** nominal maximum aggregate size.
- D. Water: ASTM C 94/C 94M.

## 2.4 RELATED MATERIALS

- A. Vapor Retarder: Polyethylene sheet, ASTM D 4397, not less than 10 mils (0.25 mm) thick; or plastic sheet, ASTM E 1745, Class C.
- B. Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber, or ASTM D 1752, cork or self-expanding cork.

## 2.5 CURING MATERIALS

- A. Evaporation Retarder: Waterborne, monomolecular film forming; manufactured for application to fresh concrete.
- B. Absorptive Cover: AASHTO M 182, Class 3, burlap cloth or cotton mats.
- C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
- D. Water: Potable.

## 2.6 CONCRETE MIXTURES

- A. Comply with ACI 301 (ACI 301M).

B. Normal-Weight Concrete:

1. Minimum Compressive Strength: **3000 psi (20.7 MPa)** at 28 days.
2. Maximum W/C Ratio: **0.50**.
3. Cementitious Materials: Use fly ash, pozzolan, slag cement, and silica fume as needed to reduce the total amount of portland cement, which would otherwise be used, by not less than 40 percent.
4. Slump Limit: **3 inches (100 mm)**, plus or minus 1 inch (25 mm).
5. Air Content: Maintain within range permitted by ACI 301 (ACI 301M). Do not allow air content of trowel-finished floor slabs to exceed 3 percent.

2.7 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M, and furnish batch ticket information.
1. When air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.
- B. Project-Site Mixing: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M. Mix concrete materials in appropriate drum-type batch machine mixer.
1. For mixer capacity of 1 cu. yd. (0.76 cu. m) or smaller, continue mixing at least 1-1/2 minutes, but not more than 5 minutes after ingredients are in mixer, before any part of batch is released.
  2. Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mix type, mix time, quantity, and amount of water added. Record approximate location of final deposit in structure.

PART 3 - EXECUTION

3.1 FORMWORK INSTALLATION

- A. Design, construct, erect, brace, and maintain formwork according to ACI 301 (ACI 301M).

3.2 VAPOR-RETARDER INSTALLATION

- A. Install, protect, and repair vapor retarders according to ASTM E 1643; place sheets in position with longest dimension parallel with direction of pour.
1. Lap joints 6 inches (150 mm) and seal with manufacturer's recommended adhesive or joint tape.

### 3.3 STEEL REINFORCEMENT INSTALLATION

- A. Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.
  - 1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

### 3.4 JOINTS

- A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.
- B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.
- C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least **one-fourth** of concrete thickness, as follows:
  - 1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch (3.2 mm). Repeat grooving of contraction joints after applying surface finishes. Eliminate groover marks on concrete surfaces.
  - 2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- (3.2-mm-) wide joints into concrete when cutting action does not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.
- D. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.
  - 1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface unless otherwise indicated.

### 3.5 CONCRETE PLACEMENT

- A. Comply with ACI 301 (ACI 301M) for placing concrete.
- B. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301 (ACI 301M).
- C. Do not add water to concrete during delivery, at Project site, or during placement.
- D. Consolidate concrete with mechanical vibrating equipment according to ACI 301 (ACI 301M).

### 3.6 FINISHING FORMED SURFACES

- A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections exceeding 1/2 inch (13 mm).
  - 1. Apply to concrete surfaces **not exposed to public view**.
- B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defective areas. Remove fins and other projections exceeding 1/8 inch (3 mm).
  - 1. Apply to concrete surfaces **exposed to public view**.
- C. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

### 3.7 FINISHING UNFORMED SURFACES

- A. General: Comply with ACI 302.1R for screeding, re-straightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.
- B. Screed surfaces with a straightedge and strike off. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane before excess moisture or bleedwater appears on surface.
  - 1. Do not further disturb surfaces before starting finishing operations.
- C. Scratch Finish: Apply scratch finish to surfaces indicated and surfaces to receive concrete floor topping or mortar setting beds for ceramic or quarry tile, portland cement terrazzo, and other bonded cementitious floor finishes unless otherwise indicated.
- D. Float Finish: Apply float finish to surfaces indicated, to surfaces to receive trowel finish, and to floor and slab surfaces to be covered with fluid-applied or sheet waterproofing, fluid-applied or direct-to-deck-applied membrane roofing, or sand-bed terrazzo.
- E. Trowel Finish: Apply a hard trowel finish to surfaces indicated and to floor and slab surfaces exposed to view or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin film-finish coating system.
- F. Trowel and Fine-Broom Finish: Apply a partial trowel finish, stopping after second troweling, to surfaces indicated and to surfaces where ceramic or quarry tile is to be installed by either thickset or thinset methods. Immediately after second troweling, and when concrete is still plastic, slightly scarify surface with a fine broom.

- G. Slip-Resistive Broom Finish: Apply a slip-resistive finish to surfaces indicated and to exterior concrete platforms, steps, and ramps. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route.

### 3.8 CONCRETE PROTECTING AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and with ACI 305.1 (ACI 305.1M) for hot-weather protection during curing.
- B. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h (1 kg/sq. m x h) before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
- C. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.
- D. Curing Methods: Cure formed and unformed concrete for at least seven days by one or a combination of the following methods:
  - 1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:
    - a. Water.
    - b. Continuous water-fog spray.
    - c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch (300-mm) lap over adjacent absorptive covers.
  - 2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches (300 mm), and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period, using cover material and waterproof tape.

### 3.9 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
- B. Tests: Perform according to ACI 301 (ACI 301M).
  - 1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mixture exceeding 5 cu. yd. (4 cu. m), but less than 25 cu. yd. (19 cu. m), plus one set for each additional 50 cu. yd. (38 cu. m) or fraction thereof.



2. Testing Frequency: Obtain at least one composite sample for each 100 cu. yd. (76 cu. m) or fraction thereof of each concrete mixture placed each day.

END OF SECTION

## **SECTION 040516**

### **MORTAR AND MASONRY GROUT**

#### **PART 1 - GENERAL**

##### **1.1 SECTION INCLUDES**

- A. Mortar and grout for masonry.

##### **1.2 SUBMITTALS**

- A. Samples: Submit two (2) samples of mortar, installed with brick, on site.

##### **1.3 QUALITY ASSURANCE**

- A. Perform work in accordance with ACI 530 and ACI 530.1.

##### **1.4 ENVIRONMENTAL REQUIREMENTS**

- A. Cold Weather Requirements: IMIAC - Recommended Practices and Guide Specifications for Cold Weather Masonry Construction.
- B. Hot Weather Requirements: IMIAC - Recommended Practices and Guide Specifications for Hot Weather Masonry Construction.

#### **PART 2 - PRODUCTS**

##### **2.1 MATERIALS**

- A. Portland Cement: ASTM C150, Type I, gray or white color.
- B. Masonry Cement: ASTM C91, Type S, gray or white color.
- C. Premix Mortar: ASTM C387, Type S, using gray or white cement, normal strength.
- D. Mortar Aggregate: ASTM C144, standard masonry type.
- E. Hydrated Lime: ASTM C207, Type S.
- F. Grout Aggregate: ASTM C404.
- G. Water: Clean and potable.
- H. Mortar Color: Mineral oxide pigment; color to be selected by Architect.

## 2.2 MORTAR MIXES

- A. Ready Mixed Mortar: ASTM C1142, Type RS.
- B. Mortar for Load Bearing Walls and Partitions: ASTM C270, Type S, using the Property Method.
- C. Mortar for Non-Load Bearing Walls and Partitions: ASTM C270, Type N, using the Property Method.
- D. Mortar for Reinforced Masonry: ASTM C270, Type S, using the Property Method.
- E. Pointing Mortar for Masonry: ASTM C270, Type N using the Property Method.
- F. Stain Resistant Pointing Mortar: One (1) part Portland Cement, 1/8 part hydrated lime, and two (2) parts graded (80 mesh) aggregate, proportioned by volume.

## 2.3 MORTAR MIXING

- A. Thoroughly mix mortar ingredients in quantities needed for immediate use in accordance with ASTM C270 and C780.
- B. Do not use anti-freeze compounds to lower the freezing point of mortar.
- C. Add mortar color at exterior building walls only, in accordance with manufacturer's recommendations.

## 2.4 GROUT MIXES

- A. Typical Masonry: 2,000 psi strength at 28 days; 8-10 inches slump; premixed type in accordance with ASTM C94 mixed in accordance with ASTM C476 fine and coarse grout.

## 2.5 GROUT MIXING

- A. Mix grout in accordance with ASTM C94.
- B. Do not use anti-freeze compounds to lower the freezing point of grout.

## 2.6 MIX TESTS

- A. Test mortar and grout in accordance with Section 01001, Paragraph B.5 - Quality Control.
- B. Testing of Mortar Mix: In accordance with ASTM C780 for compressive strength, consistency, mortar aggregate ratio, water content, air content, and splitting tensile strength.

## PART 3 - EXECUTION

### 3.1 EXAMINATION AND PREPARATION

- A. Apply bonding agent to existing concrete surfaces.

### 3.2 INSTALLATION

- A. Install mortar and grout in accordance with premix mortar manufacturer's instructions.
- B. Work grout into masonry cores and cavities to eliminate voids. Do not displace reinforcement.

END OF SECTION

## **SECTION 042000**

### **UNIT MASONRY**

#### **PART 1 - GENERAL**

##### **1.1 SUMMARY**

**A. Section includes:**

1. Mortar.
2. Reinforcing.
3. Flashing.

##### **1.2 REFERENCES**

**A. American Society for Testing and Materials (ASTM):**

1. ASTM C 144 - Specification for Aggregate for Masonry Mortar.
2. ASTM C 150 - Specification for Portland Cement.
3. ASTM C 207 - Specification for Hydrated Lime for Masonry Purposes.
4. ASTM C 270 - Specification for Mortar for Unit Masonry.
5. ASTM C 387 - Specification for Packaged, Dry, Combined Materials for Mortar and Concrete.
6. ASTM C 404 - Specification for Aggregates for Masonry Grout.
7. ASTM C 476 - Specification for Grout for Masonry.
8. ASTM C 1019 - Method of Sampling and Testing Grout.
9. IMIAC - International Masonry Industry All-Weather Council: Recommended Practices and Guide Specifications for Cold Weather Masonry Construction.
10. Building Code Requirements for Masonry Structures ACI 530-95/ASCE 5-95/TMS 402-95.
11. Specification for Masonry Structures ACI 530.1-95/ASCE 5-95/TMS 402-95.

##### **1.3 SUBMITTALS**

- A. Masonry Unit Product Data:** Submit manufacturer's product data for each type of masonry unit, accessory, and other manufactured products, including certification that each type complies with specified requirements.
- B. Face Brick and/or Exposed Concrete Masonry Veneers:** Submit manufacturer's sample boards of colors/textures available within specified cost range. Contract shall include selection of multiple colors/textures for use on separate buildings throughout the project.
- C. Submit mix designs and color samples for grout and mortar.**

##### **1.4 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver masonry materials to project in undamaged condition.
- B. Store and handle masonry units to prevent their deterioration or damage due to moisture, temperature changes, contaminants, corrosion or other causes.

## 1.5 PROJECT CONDITIONS

- A. Protection of Work: During erection, cover top of walls with waterproof sheeting at end of each day's work. Cover partially completed structures when work is not in progress.
- B. Staining: Prevent grout or mortar or soil from staining the face of masonry to be left exposed or painted. Remove immediately grout or mortar in contact with such masonry.
- C. Cold Weather Protection:
  - 1. Do not lay masonry units which are wet or frozen.
  - 2. Remove any ice or snow formed on masonry bed by carefully applying heat until top surface is dry to the touch.
  - 3. Remove masonry damaged by freezing conditions.
- D. Environmental Requirements:
  - 1. Cold Weather Requirements: IMIAC - Recommended Practices and Guide Specifications for Cold Weather Masonry Construction.
  - 2. Specific Cold Weather Requirements: When the ambient air temperature is below 40 degrees F, heat mixing water to maintain mortar temperature between 40 degrees F and 120 degrees F until placed. When the ambient air temperature is below 32 degrees F, heat the sand and water to maintain this mortar temperature.

## PART 2 - PRODUCTS

### 2.1 MASONRY UNITS

- A. General: Comply with referenced standards and other requirements indicated below applicable to each form of concrete masonry unit required.
- B. Concrete Block (below grade): Provide units complying with characteristics indicated below for Grade, Type, face size, exposed face and, under each form of block included, for weight classification.
  - 1. Grade N.
  - 2. Size: Manufacturer's standard units with nominal face dimensions of 16 in. long x 8 in. high (15-5/8 in. x 7-5/8 in. actual) x thickness' indicated.
  - 3. Type I, moisture-controlled units.

4. Hollow Loadbearing Block: ASTM C 90, Type 1. (Solid where shown on plans)
  5. Weight Classification: Normal weight.
  6. Minimum 28-day compressive strength of 1,900 psi.
  7. All block below grade shall be filled solid with grout.
- D. Pre-Cast Sills & Lintels: Provide pre-cast concrete sills and lintels where indicated on the elevation drawings. Typical locations include horizontal transitions between brick base and siding, at window/door heads, and window sills, water table caps. Brick facades to have brick soldier course headers and sloped rowlock sills. All pre-cast sills MUST be set to slope away from the face of the building for positive drainage.
1. Units shall comply with requirements of ASTM C1364-17.
- E. Face Brick:
1. Face Brick: ASTM C216
    - a. Grade SW, 2500 psi minimum compressive strength.
    - b. Type FBS
  2. Size
    - a. Modular: 2 1/4" (57.2mm) high, 7 5/8" (193.7mm) long, 3 5/8" (92.1mm) deep.
    - b. Utility: 3 5/8" (92.1mm) high, 11 5/8" (295.3mm) long, 3 5/8" (92.1mm) deep.
  3. Maximum Initial Rate of Absorption (IRA): 30 g / min / 30 sq. in.
  4. Cored and Solid Brick: Face brick may be either cored or solid, except that only solid brick shall be used for corbelling and where cores will be exposed to view. If cored brick is furnished, core holes shall be not less than 3/4 inch from any edge and no more than 25 percent of the gross area of the brick.
  5. Special Molded Shapes: Provide special shapes as shown and required.

## 2.2 MORTAR AND GROUT MATERIALS

- A. Portland Cement: ASTM C150, Type I, except Type III may be used for cold weather construction. Provide natural color or white cement as required to produce required mortar color.
- B. Hydrated Lime: ASTM C 207, Type S.
- C. Aggregate for Mortar: ASTM C 144, except for joints less than 1/4 in. use aggregate graded with 100 percent passing the No. 16 sieve.
- D. Aggregate for Grout: ASTM C 404.

- E. Water: Clean and potable.

## 2.3 JOINT REINFORCEMENT, TIES AND ANCHORING DEVICES

- A. Materials: Comply with requirements indicated below for basic materials and with requirements indicated under each form of joint reinforcement, tie and anchor for size and other characteristics:
- B. Hot-Dip Galvanized Steel Wire: ASTM A 82 for uncoated wire and with ASTM A 123, Class B-2 (1.5 oz per sq ft of wire surface) for zinc coating applied after prefabrication into units.
- C. Joint Reinforcement: Provide welded-wire units prefabricated with deformed continuous rods and plain cross rods into straight lengths of not less than 10 in. with prefabricated corner and tee units, and complying with requirements indicated below:
  - 1. Width: Fabricate joint reinforcement in units with widths of approximately 2-in. less than nominal width of walls and partitions as required to provide mortar coverage of not less than 5/8 in. on joint faces exposed to exterior and 1/2 in. elsewhere.
  - 2. Wire Size for Side Rods: 3/16 in. diameter
  - 3. Wire Size for Cross Rods: 3/16 in. diameter
  - 4. For single-width masonry provide type as follows with single pair of side rods:
    - a. Truss design type Dur-O-Eye or Ladur-Eye by Dur-O-Wal Inc., or equal, spaced not more than 16-in. o.c.
- D. Premolded Control Joint Strips: Material as indicated below, designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.
  - 1. Polyvinyl chloride complying with ASTM D 2287, General Purpose Grade, Designation PVC-63506.

## 2.4 MORTAR AND GROUT MIXES

- A. General: Do not add admixtures including coloring pigments, air-entraining agents, accelerators, retarders, water repellent agents, anti-freeze compounds or other admixtures, unless otherwise indicated.
- B. Mortar:
  - 1. Mortar: Type "S", in accordance with the Proportion specification of ASTM C 270.
    - a. Mixing of components on-site is acceptable.
    - b. Mixing on-site water and packaged dry blended mix for mortar (ASTM C 387), that contains no masonry cement, is acceptable.



2. Pointing Mortar: Duplicate original mortar proportions. Add aluminum tristearate, calcium stearate, or ammonium stearate equal to 2 percent of Portland cement weight.

C. Mixing – Mortar:

1. Thoroughly mix mortar ingredients in accordance with ASTM C 270, in quantities needed for immediate use.
  - a. Maintain sand uniformly damp immediately before the mixing process.
  - b. Provide uniformity of mix and coloration.
  - c. Do not use anti-freeze compounds.
  - d. If water is lost by evaporation, retemper only within 2 hours of mixing. Do not retemper mortar more than 2 hours after mixing.
  - e. Add motor color at exterior building wall only, in accordance with manufacturer's recommendations. Color to be selected by Architect.

D. Mixes - Grout Fill:

1. Grout fill is for concrete masonry unit bond beams, lintels, and reinforced cells with reinforcing bars and embedded plates.
  - a. Compressive Strength: 2000 psi minimum at 28 days, as determined in accordance with the provisions of ASTM C 1019.
  - b. Slump: 8 inches, minimum; 10 inches, maximum, taken in accordance with ASTM C 143.
  - c. Use coarse grout when grout space is equal to or greater than 4 inches in both directions.
  - d. Use fine grout when grout space is smaller than 4 inches in either direction.
  - e. Do not use air-entrainment admixtures.

E. Mixing – Grout:

1. Grout: Batch and mix grout in accordance with ASTM C 94 or ASTM C476 for site batched and mixed grout. Do not use anti-freeze compounds to lower the freezing point of grout.
2. Calcium chloride is not permitted in mortar or grout. Admixtures or other chemicals containing Thiocyanates, Calcium Chloride or more than 0.1 percent chloride ions are not permitted.

## 2.5 FLEXIBLE FLASHING

- A. Materials for flashing all heads, sills, and thru-wall conditions as shown on drawings shall be copper, 3 oz per square foot in weight permanently bonded on both sides by asphalt to heavy, waterproofed, creped Kraft paper.

B. Acceptable Products:

1. COP-R-TEX Duplex as manufactured by York Manufacturing, Inc., Sanford, Maine 04073.

## PART 3 - EXECUTION

### 3.1 INSTALLATION, GENERAL

- A. Do not wet concrete masonry units.
- B. Thickness: Build single-width walls to the actual thickness of the masonry units, using units of nominal thickness indicated.
- C. Build chases and recesses as shown or required for the work of other trades. Provide not less than 8-in. of masonry between chase or recess and jamb of openings, and between adjacent chases and recesses.
- D. Leave openings for equipment to be installed before completion of masonry work. After installation of equipment, complete masonry work to match work immediately adjacent to the opening.
- E. Cut masonry units using motor-driven saws to provide clean, sharp, unchipped edges. Cut units as required to provide continuous pattern and to fit adjoining work. Use full-size units without cutting where possible.
  1. Use dry cutting saws to cut concrete masonry units.
- F. Provide temporary bracing during installation of masonry work. Maintain in place until building structure providing permanent bracing.
- G. Verification of existing conditions before starting.
- H. Verification of Conditions: Verify that field measurements, surfaces, substrates and conditions are as required, and ready to receive Work.
- I. Report in writing to Architect prevailing conditions that will adversely affect satisfactory execution of the Work of this Section. Do not proceed with Work until unsatisfactory conditions have been corrected.
- J. By beginning Work, Contractor accepts conditions and assumes responsibility for correcting unsuitable conditions encountered at no additional cost to the Owner.

### 3.2 PLACING REINFORCEMENT

- A. General: Clean reinforcement of loose rust, mill scale, earth, ice or other materials which will reduce bond to mortar or grout. Do not use reinforcing bars with kinks or bends not shown on drawings or final shop drawings, or bars with reduced cross-section due to excessive rusting or other causes.

- B. Position reinforcement accurately at the spacing shown. Support and secure vertical bars against displacement. Horizontal joint reinforcement shall be placed as the masonry work progresses. Where vertical bars are shown in close proximity, provide a clear distance between bars of not less than the nominal bar diameter or 1 in. (whichever is greater).
- C. Splice reinforcement bars where shown; do not splice at other points unless acceptable to the Architect. Provide lapped splices of 40 bar diameters. In splicing vertical bars, lap ends, place in contact and wire tie.

### 3.3 CONSTRUCTION TOLERANCES

- A. Variation from Plumb: For vertical lines and surfaces of columns, walls and arises do not exceed 1/4 in. in 10 ft.
- B. Variation from Level: For bed joints and lines of exposed lintels, sills, parapets, horizontal grooves and other conspicuous lines, do not exceed 1/4 in. in any bay or 20 ft maximum, nor 1/2 in. in 40 ft or more. For top surfaces of bearing walls do not exceed 1/8 in. between adjacent floor elements in 10 ft or 1/16 in. within width of a single unit.
- C. Variation of Linear Building Line: For position shown in plan and related portion of columns, walls and partitions, do not exceed 1/2-in. in any bay or 20 ft maximum, nor 3/4 in. in 40 ft or more.
- D. Variation in Cross-Sectional Dimensions: For columns and thickness of walls, from dimensions shown, do not exceed minus 1/4 in. nor plus 1/2 in.
- E. Variation in Mortar Joint Thickness: Do not exceed bed joint thickness indicated by more than plus or minus 1/8 in.. Do not exceed head joint thickness indicated by more than plus or minus 1/8 in.

### 3.4 LAYING MASONRY WALLS

- A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint width and to accurately locate openings, movement-type joints, returns and offsets. Avoid the use of less-than-half size units at corners, jambs and wherever possible at other locations.
- B. Lay up walls to comply with specified construction tolerances, with courses accurately spaced and coordinated with other work.
- C. Pattern Bond: Lay all masonry in running bond with vertical joint in each course centered on units in courses above and below, unless specifically indicated otherwise on plans.

### 3.5 MORTAR BEDDING AND JOINTING

- A. Lay hollow concrete masonry units with full mortar coverage on horizontal and vertical face shells.

- B. Maintain joint widths shown, except for minor variations required to maintain bond alignment. Mortar joints to match existing.
- C. Cut joints flush for masonry walls which are to be concealed or to be covered by other materials, unless otherwise indicated.
- D. Tool exposed joints slightly concave using a jointer larger than joint thickness, unless otherwise indicated.
- E. Install weeps at 32 inches on center horizontally above lintels and at bottom of exterior walls.

### 3.6 HORIZONTAL JOINT REINFORCEMENT

- A. General: Provide continuous horizontal joint reinforcement as indicated. Install longitudinal side rods in mortar for their entire length with a minimum cover of 5/8 in. on exterior side of walls, 1/2 in. elsewhere. Lap reinforcing a minimum of 6 in.

### 3.7 ANCHORING MASONRY WORK

- A. Anchor masonry work to supporting structure as indicated.

### 3.8 GROUTING

- A. General:
  - 1. Use "Fine Grout" for filling spaces less than 4 in. in both horizontal directions.
  - 2. Use "Coarse Grout" for filling 4 in. spaces or larger in both horizontal directions.
- B. Low-Lift Grouting:
  - 1. Provide minimum clear dimension of 2-in. and clear area of 8 sq in. in vertical cores to be grouted.
  - 2. Place vertical reinforcement prior to laying of CMU. Extend above elevation of maximum pour height as required to allow for splicing. Support in position at vertical intervals not exceeding 192 bar diameters nor 10 ft.
  - 3. Lay CMU to maximum pour height. Do not exceed 5 ft height.
  - 4. Pour grout using container with spout or by chute. Rod or vibrate grout during placing. Place grout continuously; do not interrupt pouring of grout for more than one hour. Terminate grout pours 1-1/2 in. below top course of pour.
  - 5. Provide cleanout holes in first course at all vertical cells which are to be filled with grout. After reinforcing of masonry is securely tied in place, plug cleanout holes with masonry units. Brace against wet grout pressure.
  - 6. Place horizontal wall reinforcement as the masonry units are laid.
  - 7. Preparation of Grout Spaces: Prior to grouting, inspect and clean grout spaces. Remove dust, dirt, mortar droppings, loose pieces of masonry and other foreign materials from grout spaces. Clean reinforcing and adjust to

proper position. Clean top surface of structural members supporting masonry to ensure bond. After final cleaning and inspection, close cleanout holes and brace closures to resist grout pressures.

8. Do not place grout until entire height of masonry to be grouted has attained sufficient strength to resist displacement of masonry units and breaking of mortar bond. Install shores and bracing, if required, before starting grouting operations.
9. Place grout by pumping into grout spaces unless alternate methods are acceptable to the Architect.
10. Limit grout pours to sections which can be completed in one working day with not more than one hour interruption of pouring operation. Place grout in lifts which do not exceed 5 ft. Allow not less than 30 minutes, or more than one hour between lifts of a given pour. Rod or vibrate each grout lift during pouring operation.
  - a. Place grout in lintels or beams over openings in one continuous pour.
11. When more than one pour is required to complete a given section of masonry, extend reinforcing beyond masonry as required for splicing. Pour grout to within 1-1/2 in. of top course of first pour. After grouted masonry is cured, lay masonry units and place reinforcing for second pour section before grouting. Repeat sequence if more pours are required.
12. Inspection: All reinforced masonry walls shall be "Engineered Masonry" and shall be inspected in accordance with ACI-530-88. Test masonry prisms in accordance with ASTM E 447, and provide quality control as required by ASTM C780. Prism strengths shall be as noted on the drawings.

### 3.9 PLACING FLEXIBLE FLASHING

- A. Heads and Sills: Flashing for heads and sills shall be cut flush with the exterior face of the wall after being left exposed for inspection purposes only. Flashing shall be carried through the wall and turned up at the inside not less than 2". Head flashing shall be carried 6" beyond both ends of the steel lintel. Both head and sill flashing shall be turned up at the sides to form a pan. All corners shall be folded, not cut. Install weepholes.
- B. Spandrels: Spandrel flashing shall start from the outside toe of the shelf angle, go up the face of the beam and then through the wall, turning up on the inside not less than 2". Install weepholes.

### 3.10 CLEANING

- A. Final Cleaning: After mortar is thoroughly set and cured, clean masonry as follows:
  1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
  2. Test cleaning methods on sample wall panel; leave 1/2 panel uncleaned for comparison purposes. Obtain Owner's approval of sample cleaning before proceeding with cleaning of masonry.

3. Protect adjacent stone and nonmasonry surfaces from contact with cleaner by covering them with liquid strippable masking agent, polyethylene film, or waterproof masking tape.
- B. Protection: Provide final protection and maintain conditions in a manner acceptable to Installer, which ensures unit masonry work being without damage and deterioration at time of substantial completion.

### 3.11 QUALITY CONTROL TESTING DURING CONSTRUCTION

- A. The Construction Contractor will employ a testing laboratory to perform tests and submit test reports.
- B. Testing - Masonry Grout: Conduct strength tests in accordance with ASTM C 1019.
- C. Testing - Masonry Mortar: Conduct strength tests in accordance with the following:
  1. Spread mortar on the masonry units  $\frac{1}{2}$  inch to  $\frac{5}{8}$  inch thick, and allow to stand for one minute.
  2. Remove mortar and place in a 2-inch by 4-inch cylinder in two layers, compressing the mortar into the cylinder using a flat-end stick or fingers. Lightly tap mold on opposite sides, level off and immediately cover molds and keep them damp until taken to the laboratory.
  3. After 48 hours' set, have the laboratory remove molds and place them in the fog room until tested in damp condition.

END OF SECTION

**SECTION 051200**  
**STRUCTURAL STEEL FRAMING**

**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. Structural steel.
- 2. Grout.

- B. Related Sections:

- 1. Section 014000 "Quality Requirements" for independent testing agency procedures and administrative requirements.
- 2. Section 055000 "Metal Fabrications".

**1.3 DEFINITIONS**

- A. Structural Steel: Elements of structural-steel frame, as classified by AISC 303, "Code of Standard Practice for Steel Buildings and Bridges."

**1.4 ACTION SUBMITTALS**

- A. Shop Drawings: Show fabrication of structural-steel components.

- 1. Include details of cuts, connections, splices, camber, holes, and other pertinent data.
- 2. Include embedment drawings.
- 3. Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length, and type of each weld. Show backing bars that are to be removed and supplemental fillet welds where backing bars are to remain.
- 4. Indicate type, size, and length of bolts, distinguishing between shop and field bolts. Identify pretensioned and slip-critical high-strength bolted connections.

## 1.5 QUALITY ASSURANCE

- A. Comply with applicable provisions of the following specifications and documents:
  - 1. AISC 303.
  - 2. AISC 341 and AISC 341s1.
  - 3. AISC 360.
  - 4. RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

## 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store materials to permit easy access for inspection and identification. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers. Protect steel members and packaged materials from corrosion and deterioration.
  - 1. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures. Repair or replace damaged materials or structures as directed.
- B. Store fasteners in a protected place in sealed containers with manufacturer's labels intact.
  - 1. Fasteners may be repackaged provided Owner's testing and inspecting agency observes repackaging and seals containers.
  - 2. Clean and relubricate bolts and nuts that become dry or rusty before use.
  - 3. Comply with manufacturers' written recommendations for cleaning and lubricating ASTM F 1852 fasteners and for retesting fasteners after lubrication.

## 1.7 COORDINATION

- A. Coordinate installation of anchorage items to be embedded in or attached to other construction without delaying the Work. Provide setting diagrams, sheet metal templates, instructions, and directions for installation.

## PART 2 - PRODUCTS

### 2.1 STRUCTURAL-STEEL MATERIALS

- A. W-Shapes: ASTM A 992/A 992M.
- B. Channels, Angles, M, S-Shapes: ASTM A 36/A 36M.
- C. Plate and Bar: ASTM A 36/A 36M.



D. Steel Pipe: ASTM A 53/A 53M, Type E or S, Grade B.

1. Weight Class: Standard, unless noted otherwise on Drawings.
2. Black except where indicated to be galvanized.

E. Welding Electrodes: Comply with AWS requirements.

## 2.2 BOLTS, CONNECTORS, AND ANCHORS

A. High-Strength Bolts, Nuts, and Washers: ASTM A 325 (ASTM A 325M), Type 1, heavy-hex steel structural bolts; ASTM A 563, Grade C, (ASTM A 563M, Class 8S) heavy-hex carbon-steel nuts; and ASTM F 436 (ASTM F 436M), Type 1, hardened carbon-steel washers; all with plain finish.

B. Unheaded Anchor Rods: ASTM F 1554, Grade 36

1. Configuration: Straight.
2. Nuts: ASTM A 563 (ASTM A 563M) heavy.
3. Plate Washers: ASTM A 36/A 36M carbon steel.
4. Washers: ASTM F 436 (ASTM F 436M), Type 1, hardened carbon steel.
5. Finish: Plain.

## 2.3 PRIMER

A. Low-Emitting Materials: Paints and coatings 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. Primer: Fabricator's standard lead- and chromate-free, nonasphaltic, rust-inhibiting primer complying with MPI#79 and compatible with topcoat.

C. Galvanizing Repair Paint: ASTM A 780.

## 2.4 GROUT

A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107, factory-packaged, nonmetallic aggregate grout, noncorrosive and nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

## 2.5 FABRICATION

- A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate according to AISC's "Code of Standard Practice for Steel Buildings and Bridges" and AISC 360.
  - 1. Camber structural-steel members where indicated.
  - 2. Fabricate beams with rolling camber up.
  - 3. Identify high-strength structural steel according to ASTM A 6/A 6M and maintain markings until structural steel has been erected.
  - 4. Mark and match-mark materials for field assembly.
  - 5. Complete structural-steel assemblies, including welding of units, before starting shop-priming operations.
- B. Thermal Cutting: Perform thermal cutting by machine to greatest extent possible.
  - 1. Plane thermally cut edges to be welded to comply with requirements in AWS D1.1/D1.1M.
- C. Bolt Holes: Cut, drill, or punch standard bolt holes perpendicular to metal surfaces.
- D. Finishing: Accurately finish ends of columns and other members transmitting bearing loads.
- E. Cleaning: Clean and prepare steel surfaces that are to remain unpainted according to SSPC-SP 3, "Power Tool Cleaning."
- F. Holes: Provide holes required for securing other work to structural steel and for other work to pass through steel framing members.
  - 1. Cut, drill, or punch holes perpendicular to steel surfaces. Do not thermally cut bolt holes or enlarge holes by burning.
  - 2. Baseplate Holes: Cut, drill, mechanically thermal cut, or punch holes perpendicular to steel surfaces.
  - 3. Weld threaded nuts to framing and other specialty items indicated to receive other work.

## 2.6 SHOP CONNECTIONS

- A. High-Strength Bolts: Shop install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.
  - 1. Joint Type: Snug tightened.

- B. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.
  - 1. Assemble and weld built-up sections by methods that will maintain true alignment of axes without exceeding tolerances in AISC 303 for mill material.

## 2.7 SHOP PRIMING

- A. Shop prime steel surfaces except the following:
  - 1. Surfaces embedded in concrete or mortar. Extend priming of partially embedded members to a depth of 2 inches (50 mm).
  - 2. Surfaces to be field welded.
  - 3. Surfaces to be high-strength bolted with slip-critical connections.
  - 4. Surfaces to receive sprayed fire-resistive materials (applied fireproofing).
  - 5. Galvanized surfaces.
- B. Surface Preparation: Clean surfaces to be painted. Remove loose rust and mill scale and spatter, slag, or flux deposits. Prepare surfaces according to the following specifications and standards:
  - 1. SSPC-SP 2, "Hand Tool Cleaning."
  - 2. SSPC-SP 3, "Power Tool Cleaning."
- C. Priming: Immediately after surface preparation, apply primer according to manufacturer's written instructions and at rate recommended by SSPC to provide a minimum dry film thickness of 1.5 mils (0.038 mm). Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.
  - 1. Stripe paint corners, crevices, bolts, welds, and sharp edges.

## 2.8 GALVANIZING

- A. Hot-Dip Galvanized Finish: Apply zinc coating by the hot-dip process to structural steel according to ASTM A 123/A 123M.
  - 1. Fill vent and drain holes that will be exposed in the finished Work unless they will function as weep holes, by plugging with zinc solder and filing off smooth.
  - 2. Galvanize lintels, shelf angles and all structural steel exposed to weathers attached to structural-steel frame and located in exterior walls.

## 2.9 SOURCE QUALITY CONTROL

- A. Testing Agency: Owner will engage an independent testing and inspecting agency to perform shop tests and inspections and prepare test reports.
  - 1. Provide testing agency with access to places where structural-steel work is being fabricated or produced to perform tests and inspections.
- B. Correct deficiencies in Work that test reports and inspections indicate does not comply with the Contract Documents.
- C. Bolted Connections: Shop-bolted connections will be inspected according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
- D. Welded Connections: In addition to visual inspection, shop-welded connections will be tested and inspected according to AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:
  - 1. Liquid Penetrant Inspection: ASTM E 165.
  - 2. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration will not be accepted.
  - 3. Ultrasonic Inspection: ASTM E 164.
  - 4. Radiographic Inspection: ASTM E 94.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Verify, with steel Erector present, elevations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments for compliance with requirements.
  - 1. Prepare a certified survey of bearing surfaces, anchor rods, bearing plates, and other embedments showing dimensions, locations, angles, and elevations.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Provide temporary shores, guys, braces, and other supports during erection to keep structural steel secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural steel, connections, and bracing are in place unless otherwise indicated.

### 3.3 ERECTION

- A. Set structural steel accurately in locations and to elevations indicated and according to AISC 303 and AISC 360.
- B. Base Bearing and Leveling Plates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting plates. Clean bottom surface of plates.
  - 1. Set plates for structural members on wedges, shims, or setting nuts as required.
  - 2. Weld plate washers to top of baseplate.
  - 3. Snug-tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
  - 4. Promptly pack grout solidly between bearing surfaces and plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.
- C. Maintain erection tolerances of structural steel within AISC's "Code of Standard Practice for Steel Buildings and Bridges."
- D. Align and adjust various members that form part of complete frame or structure before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that will be in permanent contact with members. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.
- E. Splice members only where indicated.
- F. Do not use thermal cutting during erection.
- G. Do not enlarge unfair holes in members by burning or using drift pins. Ream holes that must be enlarged to admit bolts.

### 3.4 FIELD CONNECTIONS

- A. High-Strength Bolts: Install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.
  - 1. Joint Type: Snug tightened.
- B. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.
  - 1. Comply with AISC 303 and AISC 360 for bearing, alignment, adequacy of temporary connections, and removal of paint on surfaces adjacent to field welds.

2. Remove backing bars or runoff tabs where indicated, back gouge, and grind steel smooth.
3. Assemble and weld built-up sections by methods that will maintain true alignment of axes without exceeding tolerances in AISC's "Code of Standard Practice for Steel Buildings and Bridges" for mill material.

### 3.5 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to inspect field welds and high-strength bolted connections.
- B. Bolted Connections: Bolted connections will be tested and inspected according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
- C. Welded Connections: Field welds will be visually inspected according to AWS D1.1/D1.1M.
  1. In addition to visual inspection, field welds will be tested and inspected according to AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:
    - a. Liquid Penetrant Inspection: ASTM E 165.
    - b. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration will not be accepted.
    - c. Ultrasonic Inspection: ASTM E 164.
    - d. Radiographic Inspection: ASTM E 94.
- D. Correct deficiencies in Work that test reports and inspections indicate does not comply with the Contract Documents.

### 3.6 REPAIRS AND PROTECTION

- A. Galvanized Surfaces: Clean areas where galvanizing is damaged or missing and repair galvanizing to comply with ASTM A 780.
- B. Touchup Painting: Immediately after erection, clean exposed areas where primer is damaged or missing and paint with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
  1. Clean and prepare surfaces by SSPC-SP 2 hand-tool cleaning or SSPC-SP 3 power-tool cleaning.

END OF SECTION

**SECTION 054000**  
**COLD-FORMED METAL FRAMING**

**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. Interior non-load-bearing wall framing.
- B. Related Requirements:
  - 1. Section 055000 "Metal Fabrications".

**1.3 ACTION SUBMITTALS**

- A. Product Data: For each type of cold-formed steel framing product and accessory.
- B. Shop Drawings:
  - 1. Include layout, spacings, sizes, thicknesses, and types of cold-formed steel framing; fabrication; and fastening and anchorage details, including mechanical fasteners.
  - 2. Indicate reinforcing channels, opening framing, supplemental framing, strapping, bracing, bridging, splices, accessories, connection details, and attachment to adjoining work.

**1.4 QUALITY ASSURANCE**

- A. Testing Agency Qualifications: Qualified according to ASTM E 329 for testing indicated.
- B. Product Tests: Mill certificates or data from a qualified independent testing agency, or in-house testing with calibrated test equipment indicating steel sheet complies with requirements, including base-metal thickness, yield strength, tensile strength, total elongation, chemical requirements, and metallic-coating thickness.
- C. Welding Qualifications: Qualify procedures and personnel according to the following:
  - 1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
  - 2. AWS D1.3/D1.3M, "Structural Welding Code - Sheet Steel."

## 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Protect cold-formed steel framing from corrosion, moisture staining, deformation, and other damage during delivery, storage, and handling.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Manufacturers (or equivalent): Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - 1. Dietrich Metal Framing; a Worthington Industries Company.
  - 2. MarinoWARE.
  - 3. Nuconsteel; a Nucor Company.
  - 4. Steel Network, Inc. (The).
  - 5. Super Stud Building Products, Inc.
  - 6. United Steel Manufacturing.

### 2.2 COLD-FORMED STEEL FRAMING, GENERAL

- A. Steel Sheet: ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated, of grade and coating weight as follows:
  - 1. Grade: ST33H (ST230H) for 18 and 20 gage material, ST50H (ST340H) for 12 to 16 gage material.
  - 2. Coating: G60 (Z180).
- B. Steel Sheet for Clips: ASTM A 653/A 653M, structural steel, zinc coated, of grade and coating as follows:
  - 1. Grade: 50 (340), Class 1.
  - 2. Coating: G60 (Z180).

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

- A. Steel Studs: Manufacturer's standard C-shaped steel studs, of web depths indicated, punched, with stiffened flanges, and as follows:
  - 1. Minimum Base-Metal Thickness: 0.0428 inch (1.09 mm).
  - 2. Flange Width: 1-5/8 inches (41 mm).
- B. Steel Track: Manufacturer's standard U-shaped steel track, of web depths indicated, unpunched, with unstiffened flanges, and as follows:
  - 1. Minimum Base-Metal Thickness: 0.0428 inch (1.09 mm).
  - 2. Flange Width: 1-1/4 inches (32 mm).



- C. Vertical Deflection Clips: Manufacturer's standard clips, capable of accommodating upward and downward vertical displacement of primary structure through positive mechanical attachment to stud web.
1. Manufacturers (or equivalent): 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. Dietrich Metal Framing; a Worthington Industries company.
    - b. MarinoWARE.
    - c. Steel Network, Inc. (The).

## 2.4 FRAMING ACCESSORIES

- A. Fabricate steel-framing accessories from steel sheet, ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated, of same grade and coating weight used for framing members.
- 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. Anchor clips.
  5. End clips.
  6. Foundation clips.
  7. Gusset plates.
  8. Stud kickers and knee braces.
  9. Joist hangers and end closures.
  10. Hole reinforcing plates.
  11. Backer plates.

## 2.5 ANCHORS, CLIPS, AND FASTENERS

- A. Steel Shapes and Clips: ASTM A 36/A 36M, zinc coated by hot-dip process according to ASTM A 123/A 123M.
- B. Anchor Bolts: ASTM F 1554, Grade 36, threaded carbon-steel headless bolts, with encased end threaded, and carbon-steel nuts; and flat, hardened-steel washers; zinc coated by hot-dip process according to ASTM A 153/A 153M, Class C.
- C. Expansion Anchors: Fabricated from corrosion-resistant materials, with allowable load or strength design capacities calculated according to ICC-ES AC193 and ACI 318 greater than or equal to the design load, as determined by testing per ASTM E 488 conducted by a qualified testing agency.
- D. Power-Actuated Anchors: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with allowable load capacities calculated according to ICC-ES AC70, greater than or equal to the design load, as determined by testing per ASTM E 1190 conducted by a qualified testing agency.
- E. Mechanical Fasteners: ASTM C 1513, corrosion-resistant-coated, self-drilling, self-tapping, 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.
- B. Shims: Load bearing, high-density multimonomer plastic, and nonleaching; or of cold-formed steel of same grade and coating as framing members supported by shims.

## 2.7 FABRICATION

- A. Fabricate cold-formed steel framing and accessories plumb, square, and true to line, and with connections securely fastened, according to referenced AISI's specifications and standards, manufacturer's written instructions, 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 steel framing members by welding, screw fastening, clinch fastening, pneumatic pin fastening, or riveting as standard with fabricator. Wire tying of framing members is not permitted.
    - a. Comply with AWS D1.3/D1.3M 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 no fewer than three exposed screw threads.
  4. Fasten other materials to cold-formed steel framing by welding, bolting, pneumatic pin fastening, 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 (1:960) and as follows:
1. Spacing: Space individual framing members no more than plus or minus 1/8 inch (3 mm) from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.
  2. Squareness: Fabricate each cold-formed steel framing assembly to a maximum out-of-square tolerance of 1/8 inch (3 mm).

## 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 of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION, GENERAL

- A. Cold-formed steel framing may be shop or field fabricated for installation, or it may be field assembled.
- B. Install cold-formed steel framing according to AISI S200 and to manufacturer's written instructions unless more stringent requirements are indicated.
- C. Install shop- or field-fabricated, cold-formed framing and securely anchor to supporting structure.
  - 1. Screw, 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 (1.6 mm).
- D. Install cold-formed steel framing and accessories plumb, square, and true to line, and with connections securely fastened.
  - 1. Cut framing members by sawing or shearing; do not torch cut.
  - 2. Fasten cold-formed steel framing members by welding, screw fastening, clinch fastening, or riveting. Wire tying of framing members is not permitted.
    - a. Comply with AWS D1.3/D1.3M 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, and complying with requirements for spacing, edge distances, and screw penetration.
- 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. Fasten hole reinforcing plate over web penetrations that exceed size of manufacturer's approved or standard punched openings.
- H. Erection Tolerances: Install cold-formed steel framing level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet (1:960) and as follows:
  - 1. Space individual framing members no more than plus or minus 1/8 inch (3 mm) from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.

### 3.3 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 (406 mm) maximum.

- C. Set studs plumb, except as needed for diagonal bracing or required for nonplumb 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.
  - 2. Connect vertical deflection clips to studs and anchor to building structure.
  - 3. Connect drift clips to cold-formed metal framing and anchor to building structure.
- E. Install horizontal bridging in wall studs, spaced vertically in rows indicated on Shop Drawings but not more than 48 inches (1220 mm) apart. Fasten at each stud intersection.
  - 1. Top Bridging for Single Deflection Track: Install row of horizontal bridging within 12 inches (305 mm) of single deflection track. Install a combination of bridging and stud or stud-track solid blocking of width and thickness matching studs, secured to stud webs or flanges.
  - 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, and fasteners, to provide a complete and stable wall-framing system.

### 3.4 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 spacings 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 (38 mm).
  - 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 (51 mm) from abutting walls, and as follows:
  - 1. Joist Spacing: 24 inches (610 mm); maximum.
- D. Frame openings with built-up joist headers consisting of joist and joist track, 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 intervals indicated on Shop Drawings. Fasten bridging at each joist intersection as follows:
  - 1. Bridging: Joist-track solid blocking of width and thickness indicated, secured to joist webs.

2. Bridging: Combination of flat, taut, steel sheet straps of width and thickness indicated and joist-track solid blocking of width and thickness indicated. Fasten flat straps to bottom flange of joists and secure solid blocking to joist webs.

- G. Secure joists to load-bearing interior walls 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.

### 3.5 FIELD QUALITY CONTROL

- A. Testing: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.
- B. Field and shop welds will be subject to testing and inspecting.
- C. Testing agency will report test results promptly and in writing to Contractor and Architect.
- D. Remove and replace work where test results indicate that it does not comply with specified requirements.
- E. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

### 3.6 REPAIRS AND PROTECTION

- A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on fabricated and installed cold-formed steel 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 that cold-formed steel framing is without damage or deterioration at time of Substantial Completion.

END OF SECTION

**SECTION 061000**  
**ROUGH CARPENTRY**

**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. Framing with dimension lumber.
  - 2. Framing with engineered wood products.
  - 3. Wood blocking, and nailers.
- B. Related Requirements:
  - 1. Section 061602 "Sheathing."

**1.3 DEFINITIONS**

- A. Exposed Framing: Framing not concealed by other construction.
- B. Dimension Lumber: Lumber of 2 inches nominal (38 mm actual) or greater but less than 5 inches nominal (114 mm actual) in least dimension.
- C. Lumber grading agencies, and the abbreviations used to reference them, include the following:
  - 1. NeLMA: Northeastern Lumber Manufacturers' Association.
  - 2. NLGA: National Lumber Grades Authority.
  - 3. SPIB: The Southern Pine Inspection Bureau.
  - 4. WCLIB: West Coast Lumber Inspection Bureau.
  - 5. WWPA: Western Wood Products Association.

**1.4 ACTION SUBMITTALS**

- A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.

## 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Stack lumber flat with spacers beneath and between each bundle to provide air circulation. Protect lumber from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

## PART 2 - PRODUCTS

- A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
  1. Factory mark each piece of lumber with grade stamp of grading agency.
  2. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.
  3. Provide dressed lumber, S4S, unless otherwise indicated.
- B. Maximum Moisture Content of Lumber: 15 percent for 2-inch nominal (38-mm actual) thickness or less, 19 percent for more than 2-inch nominal (38-mm actual) thickness] unless otherwise indicated.
- C. Engineered Wood Products: Provide engineered wood products acceptable to authorities having jurisdiction and for which current model code research or evaluation reports exist that show compliance with building code in effect for Project.
  1. Allowable Design Stresses: Provide engineered wood products with allowable design stresses, as published by manufacturer, that meet or exceed those indicated. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.

## 2.2 WOOD-PRESERVATIVE-TREATED LUMBER

- A. Preservative Treatment by Pressure Process: AWPAC U1; Use Category UC2 for interior construction not in contact with the ground, Use Category UC3b for exterior construction not in contact with the ground, and Use Category UC4a for items in contact with the ground.

1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium. Do not use inorganic boron (SBX) for sill plates.
- B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or that does not comply with requirements for untreated material.
- C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.
- D. Application: Treat items indicated on Drawings, and the following as applicable:
  1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
  2. Wood sills, sleepers, blocking, and similar concealed members in contact with masonry or concrete.
  3. Wood framing and furring attached directly to the interior of below-grade exterior masonry or concrete walls.
  4. Wood framing members that are less than 18 inches (460 mm) above the ground in crawlspaces or unexcavated areas.
  5. Wood floor plates that are installed over concrete slabs-on-grade.

## 2.3 DIMENSION LUMBER FRAMING

- A. Non-Load-Bearing Interior Partitions: Construction or No. 2 grade.
  1. Application: Interior partitions not indicated as load-bearing.
  2. Species:
    - a. Mixed southern pine; SPIB.
    - b. Hem-fir; WCLIB, or WWPA.
    - c. Spruce-pine-fir (south); NeLMA, WCLIB, or WWPA.
    - d. Eastern softwoods; NeLMA.
- B. Load-Bearing Partitions: No. 2 grade.
  1. Application: Exterior walls and interior load-bearing partitions.
  2. Species:
    - a. Southern pine; SPIB.
    - b. Douglas fir-larch; WCLIB or WWPA.
    - c. Douglas fir-south; WWPA.
    - d. Hem-fir; WCLIB or WWPA.
- C. Joists, Rafters, and Other Framing Not Listed Above: No. 2 grade.
  1. Species:



- a. Southern pine; SPIB.
- b. Douglas fir-larch; WCLIB or WWPA.
- c. Douglas fir-south; WWPA.
- d. Hem-fir; WCLIB or WWPA.

## 2.4 ENGINEERED WOOD PRODUCTS

- A. Source Limitations: Obtain each type of engineered wood product from single source from a single manufacturer.
- B. Laminated-Veneer Lumber: Structural composite lumber made from wood veneers with grain primarily parallel to member lengths, evaluated and monitored according to ASTM D 5456 and manufactured with an exterior-type adhesive complying with ASTM D 2559.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Boise Cascade Corporation.
    - b. Georgia-Pacific.
    - c. Louisiana-Pacific Corporation.
    - d. Weyerhaeuser Company.
  - 2. Extreme Fiber Stress in Bending, Edgewise: 2600 psi (17.9 MPa) for 12-inch nominal- (286-mm actual-) depth members.
  - 3. Modulus of Elasticity, Edgewise: 1,800,000 psi (12 400 MPa).
- C. Parallel-Strand Lumber: Structural composite lumber made from wood strand elements with grain primarily parallel to member lengths, evaluated and monitored according to ASTM D 5456 and manufactured with an exterior-type adhesive complying with ASTM D 2559.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Louisiana-Pacific Corporation.
    - b. Weyerhaeuser Company.
  - 2. Extreme Fiber Stress in Bending, Edgewise: 2900 psi (20 MPa) for 12-inch nominal- (286-mm actual-) depth members.
  - 3. Modulus of Elasticity, Edgewise: 2,200,000 psi (15 100 MPa).
- D. Rim Boards: Product designed to be used as a load-bearing member and to brace wood I-joists at bearing ends, complying with research/evaluation report for I-joists.
  - 1. Manufacturer: Provide products by same manufacturer as laminated veneer lumber and parallel strand lumber.
  - 2. Material: product made from any combination solid lumber, wood strands, and veneers.
  - 3. Thickness: 1-1/4 inches (32 mm).

## 2.5 MISCELLANEOUS LUMBER

- A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:
  - 1. Blocking.
  - 2. Nailers.
- B. For items of dimension lumber size, provide Standard, Stud, or No. 3 grade lumber of any species.
  - 1. Mixed southern pine; SPIB.
  - 2. Hem-fir; WCLIB or WWPA.
  - 3. Spruce-pine-fir (south); NeLMA, WCLIB, or WWPA.
  - 4. Western woods; WCLIB or WWPA.
  - 5. Eastern softwoods; NeLMA.
- C. For blocking not used for attachment of other construction, Utility, Stud, or No. 3 grade lumber of any species may be used provided that it is cut and selected to eliminate defects that will interfere with its attachment and purpose.
- D. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.

## 2.6 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.
  - 1. Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.
- B. Nails, Brads, and Staples: ASTM F 1667.
- C. Power-Driven Fasteners: NES NER-272.
- D. Wood Screws: ASME B18.6.1.
- E. Lag Bolts: ASME B18.2.1 (ASME B18.2.3.8M).
- F. Bolts: Steel bolts complying with ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); with ASTM A 563 (ASTM A 563M) hex nuts and, where indicated, flat washers.
- G. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to six times the load imposed when installed in unit masonry assemblies and equal to four times the load imposed when installed in concrete as determined by testing per ASTM E 488 conducted by a qualified independent testing and inspecting agency.

1. Material: Carbon-steel components, zinc plated to comply with ASTM B 633, Class Fe/Zn 5.
2. Material: Stainless steel with bolts and nuts complying with ASTM F 593 and ASTM F 594, Alloy Group 1 or 2 (ASTM F 738M and ASTM F 836M, Grade A1 or A4).

## 2.7 METAL FRAMING ANCHORS

- A. Manufacturers: Subject to compliance with requirements, [provide products by the following] [provide products by one of the following] [available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:
- B. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings; product name or designation> or comparable product by one of the following:
  1. Simpson Strong-Tie Co., Inc.
  2. USP Structural Connectors.
- C. Allowable Design Loads: Provide products with allowable design loads, as published by manufacturer, that meet or exceed those indicated. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.
- D. Galvanized-Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A 653/A 653M, G60 (Z180) coating designation.
  1. Use for interior locations unless otherwise indicated.
- E. Hot-Dip, Heavy-Galvanized Steel Sheet: ASTM A 653/A 653M; structural steel (SS), high-strength low-alloy steel Type A (HSLAS Type A), or high-strength low-alloy steel Type B (HSLAS Type B); G185 (Z550) coating designation; and not less than 0.036 inch (0.9 mm) thick.
  1. Use for wood-preservative-treated lumber and where indicated.
- F. Top Flange Hangers: U-shaped joist hangers, full depth of joist, formed from metal strap with tabs bent to extend over and be fastened to supporting member.
  1. Strap Width: 1-1/2 inches (38 mm).
  2. Thickness: 0.050 inch (1.3 mm).
- G. Post Bases: Adjustable-socket type for bolting in place with standoff plate to raise post 1 inch (25 mm) above base and with 2-inch- (50-mm-) minimum side cover, socket 0.062 inch (1.6 mm) thick, and standoff and adjustment plates 0.108 inch (2.8 mm) thick.

- H. Rafter Tie-Downs: Bent strap tie for fastening rafters or roof trusses to wall studs below, 1-1/2 inches (38 mm) wide by 0.050 inch (1.3 mm) thick.
- I. Floor-to-Floor Ties: Flat straps, with holes for fasteners, for tying upper floor wall studs to band joists and lower floor studs, 1-1/4 inches (32 mm) wide by 0.050 inch (1.3 mm) thick by 36 inches (914 mm) long.
- J. Hold-Downs: Brackets for bolting to wall studs and securing to foundation walls with anchor bolts or to other hold-downs with threaded rods and designed with first of two bolts placed seven bolt diameters from reinforced base.
  - 1. Bolt Diameter: [5/8 inch (15.8 mm)] [3/4 inch (19 mm)].
  - 2. Width: [2-1/2 inches (64 mm)] [3-3/16 inches (81 mm)].
  - 3. Body Thickness: [0.108 inch (2.8 mm)] [0.138 inch (3.5 mm)].
  - 4. Base Reinforcement Thickness: [0.108 inch (2.8 mm)] [0.239 inch (6.1 mm)].

## 2.8 MISCELLANEOUS MATERIALS

- A. Sill-Sealer Gaskets: Glass-fiber-resilient insulation, fabricated in strip form, for use as a sill sealer; 1-inch (25-mm) nominal thickness, compressible to 1/32 inch (0.8 mm); selected from manufacturer's standard widths to suit width of sill members indicated.
- B. Sill-Sealer Gaskets: Closed-cell neoprene foam, 1/4 inch (6.4 mm) thick, selected from manufacturer's standard widths to suit width of sill members indicated.
- C. Flexible Flashing: Composite, self-adhesive, flashing product consisting of a pliable, [butyl rubber] [or] [rubberized-asphalt] compound, bonded to a high-density polyethylene film, aluminum foil, or spunbonded polyolefin to produce an overall thickness of not less than 0.025 inch (0.6 mm).
- D. Water-Repellent Preservative: NWWDA-tested and -accepted formulation containing 3-iodo-2-propynyl butyl carbamate, combined with an insecticide containing chlorpyrifos as its active ingredient.

## PART 3 - EXECUTION

### 3.1 INSTALLATION, GENERAL

- A. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry to other construction; scribe and cope as needed for accurate fit. Locate nailers, blocking, and similar supports to comply with requirements for attaching other construction.
- B. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.
- C. Framing with Engineered Wood Products: Install engineered wood products to comply with manufacturer's written instructions.

- D. Metal Framing Anchors: Install metal framing anchors to comply with manufacturer's written instructions. Install fasteners through each fastener hole.
- E. Install sill sealer gasket to form continuous seal between sill plates and foundation walls.
- F. Do not splice structural members between supports unless otherwise indicated.
- G. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.
  - 1. Provide metal clips for fastening gypsum board or lath at corners and intersections where framing or blocking does not provide a surface for fastening edges of panels. Space clips not more than 16 inches (406 mm) o.c.
- H. Provide fire blocking in furred spaces, stud spaces, and other concealed cavities as indicated and as follows:
  - 1. Fire block furred spaces of walls, at each floor level, at ceiling, and at not more than 96 inches (2438 mm) o.c. with solid wood blocking or noncombustible materials accurately fitted to close furred spaces.
  - 2. Fire block concealed spaces of wood-framed walls and partitions at each floor level, at ceiling line of top story, and at not more than 96 inches (2438 mm) o.c. Where fire blocking is not inherent in framing system used, provide closely fitted solid wood blocks of same width as framing members and 2-inch nominal- (38-mm actual-) thickness.
  - 3. Fire block concealed spaces between floor sleepers with same material as sleepers to limit concealed spaces to not more than 100 sq. ft. (9.3 sq. m) and to solidly fill space below partitions.
  - 4. Fire block concealed spaces behind combustible cornices and exterior trim at not more than 20 feet (6 m) o.c.
- I. Sort and select lumber so that natural characteristics will not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.
- J. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.
  - 1. Use inorganic boron for items that are continuously protected from liquid water.
  - 2. Use copper naphthenate for items not continuously protected from liquid water.
- K. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
  - 1. NES NER-272 for power-driven fasteners.
  - 2. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code.
  - 3. Table R602.3(1), "Fastener Schedule for Structural Members," and Table R602.3(2), "Alternate Attachments," in ICC's International Residential Code for One- and Two-Family Dwellings.

- L. Use steel common nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood. Drive nails snug but do not countersink nail heads unless otherwise indicated.

### 3.2 WOOD BLOCKING, AND NAILER INSTALLATION

- A. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.
- B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.
- C. Where wood-preservative-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.
- D. Provide permanent grounds of dressed, pressure-preservative-treated, key-beveled lumber not less than 1-1/2 inches (38 mm) wide and of thickness required to bring face of ground to exact thickness of finish material. Remove temporary grounds when no longer required.

### 3.3 WALL AND PARTITION FRAMING INSTALLATION

- A. General: Provide single bottom plate and double top plates using members of 2-inch nominal (38-mm actual) thickness whose widths equal that of studs, except single top plate may be used for non-load-bearing partitions. Fasten plates to supporting construction unless otherwise indicated.
  - 1. For exterior walls, provide 2-by-6-inch nominal- (38-by-140-mm actual-) size wood studs spaced 16 inches (406 mm) o.c. unless otherwise indicated.
  - 2. For interior partitions and walls, provide 2-by-4-inch nominal- (38-by-89-mm actual-) size wood studs spaced 16 inches (406 mm) o.c. unless otherwise indicated.
  - 3. Provide continuous horizontal blocking at midheight of partitions more than 96 inches (2438 mm) high, using members of 2-inch nominal (38-mm actual) thickness and of same width as wall or partitions.
- B. Construct corners and intersections with three or more studs, except that two studs may be used for interior non-load-bearing partitions.
- C. Frame openings with multiple studs and headers. Provide nailed header members of thickness equal to width of studs. Support headers on jamb studs.
  - 1. For non-load-bearing partitions, provide double-jamb studs and headers not less than 4-inch nominal (89-mm actual) depth for openings 48 inches (1200 mm) and less in width, 6-inch nominal (140-mm actual) depth for openings 48 to 72 inches (1200 to 1800 mm) in width, 8-inch nominal (184-mm actual) depth for openings

- 72 to 120 inches (1800 to 3000 mm) in width, and not less than 10-inch nominal (235-mm actual) depth for openings 10 to 12 feet (3 to 3.6 m) in width.
2. For load-bearing walls, provide double-jamb studs for openings 60 inches (1500 mm) and less in width, and triple-jamb studs for wider openings. Provide headers of depth indicated.

### 3.4 FLOOR JOIST FRAMING INSTALLATION

- A. General: Install floor joists with crown edge up and support ends of each member with not less than 1-1/2 inches (38 mm) of bearing on wood or metal, or 3 inches (76 mm) on masonry. Attach floor joists as follows:
  1. Where supported on wood members, by toe nailing or by using metal framing anchors.
  2. Where framed into wood supporting members, by using wood ledgers as indicated or, if not indicated, by using metal joist hangers.
- B. Frame openings with headers and trimmers supported by metal joist hangers; double headers and trimmers where span of header exceeds 48 inches (1200 mm).
- C. Do not notch in middle third of joists; limit notches to one-sixth depth of joist, one-third at ends. Do not bore holes larger than 1/3 depth of joist; do not locate closer than 2 inches (50 mm) from top or bottom.
- D. Provide solid blocking of 2-inch nominal (38-mm actual) thickness by depth of joist at ends of joists unless nailed to header or band.
- E. Lap members framing from opposite sides of beams, girders, or partitions not less than 4 inches (102 mm) or securely tie opposing members together. Provide solid blocking of 2-inch nominal (38-mm actual) thickness by depth of joist over supports.
- F. Provide solid blocking between joists under jamb studs for openings.
- G. Under non-load-bearing partitions, provide double joists separated by solid blocking equal to depth of studs above.
  1. Provide triple joists separated as above, under partitions receiving ceramic tile and similar heavy finishes or fixtures.
- H. Provide bridging of type indicated below, at intervals of 96 inches (2438 mm) o.c., between joists.
  1. Diagonal wood bridging formed from bevel-cut, 1-by-3-inch nominal- (19-by-64-mm actual-) size lumber, double-crossed and nailed at both ends to joists.
  2. Steel bridging installed to comply with bridging manufacturer's written instructions.

### 3.5 CEILING JOIST AND RAFTER FRAMING INSTALLATION

- A. Ceiling Joists: Install ceiling joists with crown edge up and complying with requirements specified above for floor joists. Face nail to ends of parallel rafters.
  - 1. Where ceiling joists are at right angles to rafters, provide additional short joists parallel to rafters from wall plate to first joist; nail to ends of rafters and to top plate and nail to first joist or anchor with framing anchors or metal straps. Provide 1-by-8-inch nominal- (19-by-184-mm actual-) size or 2-by-4-inch nominal- (38-by-89-mm actual-) size stringers spaced 48 inches (1200 mm) o.c. crosswise over main ceiling joists.
- B. Rafters: Notch to fit exterior wall plates and use metal framing anchors. Double rafters to form headers and trimmers at openings in roof framing, if any, and support with metal hangers. Where rafters abut at ridge, place directly opposite each other and nail to ridge member or use metal ridge hangers.
  - 1. At valleys, provide double-valley rafters of size indicated or, if not indicated, of same thickness as regular rafters and 2 inches (50 mm) deeper. Bevel ends of jack rafters for full bearing against valley rafters.
  - 2. At hips, provide hip rafter of size indicated or, if not indicated, of same thickness as regular rafters and 2 inches (50 mm) deeper. Bevel ends of jack rafters for full bearing against hip rafter.
- C. Provide collar beams (ties) as indicated or, if not indicated, provide 1-by-6-inch nominal- (19-by-140-mm actual-) size boards between every third pair of rafters, but not more than 48 inches (1219 mm) o.c. Locate below ridge member, at third point of rafter span. Cut ends to fit roof slope and nail to rafters.
- D. Provide special framing as indicated for eaves, overhangs, dormers, and similar conditions if any.

### 3.6 STAIR FRAMING INSTALLATION

- A. Provide stair framing members of size, space, and configuration indicated or, if not indicated, to comply with the following requirements:
  - 1. Size: 2-by-12-inch nominal- (38-by-286-mm actual-) size, minimum.
  - 2. Material: Laminated-veneer lumber or solid lumber.
  - 3. Notching: Notch rough carriages to receive treads, risers, and supports; leave at least 3-1/2 inches (89 mm) of effective depth.
  - 4. Spacing: At least three framing members for each 36-inch (914-mm) clear width of stair.
- B. Provide stair framing with no more than 3/16-inch (4.7-mm) variation between adjacent treads and risers and no more than 3/8-inch (9.5-mm) variation between largest and smallest treads and risers within each flight.



### 3.7 PROTECTION

- A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.
- B. Protect rough carpentry from weather. If, despite protection, rough carpentry becomes sufficiently wet that moisture content exceeds that specified, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION 061000

## **SECTION 061600**

### **SHEATHING**

#### **PART 1 - GENERAL**

##### **1.1 SUMMARY**

Note: Energy Star program requires house air leakage test - .35 air changes/hour Green Point program – see EEBA details on house wrap, building paper or layered water resistant sheathing use Low VOC sealants.

A. This Section includes the following:

1. Wall sheathing.
2. Roof sheathing.
3. Subflooring.
4. Underlayment.
5. Building paper.
6. Building wrap.
7. Sheathing joint-and-penetration treatment.
8. Flexible flashing at openings in sheathing.

##### **1.2 SUBMITTALS**

A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated plywood complies with requirements.

B. Research/Evaluation Reports: For the following:

1. Preservative-treated plywood.
2. Building wrap.

##### **1.3 DELIVERY, STORAGE, AND HANDLING**

A. Stack plywood and other panels flat with spacers between each bundle to provide air circulation. Provide for air circulation around stacks and under coverings.

#### **PART 2 - PRODUCTS**

##### **2.1 WOOD PANEL PRODUCTS, GENERAL**

- A. Plywood: DOC PS 2, unless otherwise indicated.
- B. Oriented Strand Board: DOC PS 2.

## 2.2 PRESERVATIVE-TREATED PLYWOOD

- A. Preservative Treatment by Pressure Process: AWPA C9.
- B. Mark plywood with appropriate classification marking of an inspection agency acceptable to authorities having jurisdiction.
- C. Application: Treat items indicated on Drawings and plywood in contact with masonry or concrete or used with roofing, flashing, vapor barriers, and waterproofing].

## 2.3 WALL SHEATHING

- A. Plywood Wall Sheathing: Exterior, Structural I sheathing.
  - 1. Span Rating: Not less than 32/16.
  - 2. Nominal Thickness: Not less than 7/16 inch.
- B. Oriented-Strand-Board Wall Sheathing: Exposure 1, Structural I sheathing.
  - 1. Span Rating: Not less than 32/16.
  - 2. Nominal Thickness: Not less than 7/16 inch.

## 2.4 ROOF SHEATHING

- A. Plywood Roof Sheathing: Exterior, Structural I sheathing.
  - 1. Span Rating: Not less than 32/16.
  - 2. Nominal Thickness: Not less than 5/8 inch.
- B. Oriented Strand Board Roof Sheathing: Exposure I sheathing.
  - 1. Span Rating: Not less than 32/16.
  - 2. Nominal Thickness: Not less than 7-16 inch.

## 2.5 SUBFLOORING AND UNDERLAYMENT

- A. Plywood Subflooring: Exposure 1, Structural I single-floor panels or sheathing.
- B. Plywood Underlayment for Resilient Flooring: DOC PS 1, Exposure 1 Underlayment with fully sanded face.
- C. Plywood Underlayment for Ceramic Tile: DOC PS 1, Exterior, C-C Plugged, not less than 5/8-inch nominal thickness, for ceramic tile set in epoxy adhesive.
- D. Plywood Underlayment for Carpet: DOC PS 1, Interior, Underlayment.
- E. Hardboard Underlayment: AHA A135.4, Class 4 (Service), Surface S1S; with back side sanded.

## 2.6 FASTENERS

A. General: Provide fasteners of size and type indicated.

1. For wall and roof sheathing panels, provide fasteners with corrosion-protective coating having a salt-spray resistance of more than 800 hours according to ASTM B 117.

B. Nails, Brads, and Staples: ASTM F 1667.

C. Power-Driven Fasteners: NES NER-272.

D. Wood Screws: ASME B18.6.1.

1. For wall and roof sheathing panels, provide screws with organic-polymer or other corrosion-protective coating having a salt-spray resistance of more than 800 hours according to ASTM B 117.

## 2.7 WEATHER-RESISTANT SHEATHING PAPER

A. Building Paper: ASTM D 226, Type 1 (No. 15 asphalt-saturated organic felt), unperforated.

B. Building Wrap: ASTM E 1677, Type I air retarder; with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, when tested according to ASTM E 84; UV stabilized; and acceptable to authorities having jurisdiction.

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
2. Products: Subject to compliance with requirements, provide one of the following:
  - a. Dow Chemical Company (The); Styrofoam Weathermate Plus Brand Housewrap.
  - b. DuPont (E. I. du Pont de Nemours and Company); Tyvek CommercialWrap
  - c. Ludlow Coated Products; Barricade Building Wrap.

C. Building-Wrap Tape: Tape recommended by building-wrap manufacturer.

## 2.8 SHEATHING JOINT-AND-PENETRATION TREATMENT MATERIALS

A. Sealant for Paper-Surfaced or Glass-Mat Gypsum Sheathing Board: Elastomeric silicone joint sealant recommended by sheathing manufacturer.

B. Sheathing Tape for Glass-Mat Gypsum Sheathing Board: Self-adhering glass-fiber tape, of type recommended by sheathing and tape manufacturers.

## 2.9 MISCELLANEOUS MATERIALS

A. Adhesives for Field Gluing Panels to Framing: Formulation complying with ASTM D 3498 that is approved for use indicated by manufacturers of both adhesives and panels.

- B. Flexible Flashing: Self-adhesive, rubberized-asphalt compound, bonded to a high-density, polyethylene film to produce an overall thickness of not less than **0.025 inch**.

## PART 3 - EXECUTION

### 3.1 INSTALLATION, GENERAL

- A. Do not use materials with defects that impair quality of sheathing or pieces that are too small to use with minimum number of joints or optimum joint arrangement.
- B. Cut panels at penetrations, edges, and other obstructions of work; fit tightly against abutting construction, unless otherwise indicated.
- C. Securely attach to substrate by fastening as indicated, complying with the following:
  - 1. NES NER-272 for power-driven fasteners.
  - 2. IBC 2009
- D. Coordinate sheathing installation with flashing and joint-sealant installation so these materials are installed in sequence and manner that exclude exterior moisture.
- E. Do not bridge building expansion joints; cut and space edges of panels to match spacing of structural support elements.
- F. Use common wire nails, unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections. Install fasteners without splitting wood.
- G. Coordinate sheathing installation with installation of materials installed over sheathing so sheathing is not exposed to precipitation or left exposed at end of the workday when rain is forecast.

### 3.2 WOOD STRUCTURAL PANEL INSTALLATION

- A. General: Comply with applicable recommendations in APA Form No. E30K, "APA Design/Construction Guide: Residential & Commercial."
  - 1. Comply with "Code Plus" installation provisions in guide referenced in paragraph above.
- B. Fastening Methods: Fasten panels as indicated below:
  - 1. Subflooring:
    - a. Glue and nail to wood framing.
  - 2. Wall and Roof Sheathing:
    - a. Nail or staple to wood framing. Apply a continuous bead of glue to framing members at edges of wall sheathing panels.
  - 3. Underlayment:

- a. Nail or staple to subflooring.

### 3.3 WEATHER-RESISTANT SHEATHING-PAPER INSTALLATION

- A. General: Cover sheathing with weather-resistant sheathing paper as follows:
  - 1. Cut back barrier 1/2 inch on each side of the break in supporting members at expansion- or control-joint locations.
  - 2. Apply barrier to cover vertical flashing with a minimum 4-inch overlap, unless otherwise indicated.
- B. Building Paper: Apply horizontally with a 2-inch overlap and a 6-inch end lap; fasten to sheathing with galvanized staples or roofing nails.
- C. Building Wrap: Comply with manufacturer's written instructions.
  - 1. Seal seams, edges, fasteners, and penetrations with tape.
  - 2. Extend into jambs of openings and seal corners with tape.

### 3.4 SHEATHING JOINT-AND-PENETRATION TREATMENT

- A. Seal sheathing joints according to sheathing manufacturer's written instructions.
  - 1. Apply elastomeric sealant to joints and fasteners and trowel flat. Seal other penetrations and openings.
  - 2. Apply glass-fiber sheathing tape to glass-mat gypsum sheathing board joints, and apply and trowel silicone emulsion sealant to embed tape in sealant. Apply sealant to exposed fasteners. Seal other penetrations and openings.
  - 3. Apply sheathing tape to joints between foam-plastic sheathing panels and at items penetrating sheathing. Apply at upstanding flashing to overlap both flashing and sheathing.

### 3.5 FLEXIBLE FLASHING INSTALLATION

- A. Apply flexible flashing where indicated to comply with manufacturers written instructions.
  - 1. Lap seams and junctures with other materials at least 4 inches, except that at flashing flanges of other construction, laps need not exceed flange width.
  - 2. Lap flashing over weather-resistant building paper at bottom and sides of openings.
  - 3. Lap weather-resistant building paper over flashing at heads of openings.
  - 4. After flashing has been applied, roll surfaces with a hard rubber or metal roller.

### 3.6 PROTECTION

- A. Paper-Surfaced Gypsum Sheathing: Protect sheathing by covering exposed exterior surface of sheathing with weather-resistant sheathing paper securely fastened to framing. Apply covering immediately after sheathing is installed.

END OF SECTION

**SECTION 061053**  
**MISCELLANEOUS CARPENTRY**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. This Section includes the following:
1. Framing with dimension lumber.
  2. Wood blocking, cants, and nailers.
  3. Interior wood trim.
  4. Plywood backing panels.

**1.2 SUBMITTALS**

- A. Product Data: For each type of process and factory-fabricated product.
1. Include data for wood-preservative and fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements.
- B. Research/Evaluation Reports: For the following, showing compliance with building code in effect for Project:
1. Preservative-treated wood.
  2. Fire-retardant-treated wood.
  3. Power-driven fasteners.

**1.3 QUALITY ASSURANCE**

- A. Forest Certification: For the following wood products, provide materials produced from wood obtained from forests certified by an FSC-accredited certification body to comply with FSC 1.2, "Principles and Criteria":
1. Dimension lumber framing.
  2. Miscellaneous lumber.
  3. Interior wood trim.

## PART 2 - PRODUCTS

### 2.1 WOOD PRODUCTS, GENERAL

- A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
  - 1. Factory mark each piece of lumber with grade stamp of grading agency.
  - 2. Provide dressed lumber, S4S, unless otherwise indicated.

### 2.2 WOOD-PRESERVATIVE-TREATED MATERIALS

- A. Preservative Treatment by Pressure Process: AWPAC2, except that lumber that is not in contact with the ground and is continuously protected from liquid water may be treated according to AWPAC31 with inorganic boron (SBX).
  - 1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.
- B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or does not comply with requirements for untreated material.
- C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.
- D. Application: Treat items indicated on Drawings, and the following:
  - 1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
  - 2. Wood sills, sleepers, blocking, and similar concealed members in contact with masonry or concrete.
  - 3. Wood framing and furring attached directly to the interior of below-grade exterior masonry or concrete walls.
  - 4. Wood floor plates that are installed over concrete slabs-on-grade.

### 2.3 DIMENSION LUMBER FRAMING (where specified)

- A. Maximum Moisture Content: 19 percent.
- B. Non-Load-Bearing Interior Partitions: Construction or No. 2 grade of any species.
- C. Other Framing: No. 2 grade and any of the following species:
  - 1. Hem-fir (north); NLGA.
  - 2. Douglas fir-larch (north); NLGA.



## 2.4 MISCELLANEOUS LUMBER

- A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:
  - 1. Blocking.
  - 2. Nailers.
  - 3. Cants.
- B. For items of dimension lumber size, provide Construction or No. 2 grade lumber with 19 percent maximum moisture content of any species.
- C. For concealed boards, provide lumber with 19 percent maximum moisture content and the following species and grades:
  - 1. Northern species, No. 2 Common grade; NLGA.

## 2.5 INTERIOR WOOD TRIM

- A. General: Provide kiln-dried finished (surfaced) material.
- B. Lumber Trim for Opaque (Painted) Finish: Either finger-jointed or solid lumber, of one of the following species and grades:
  - 1. Grade D Select eastern white pine; NeLMA or NLGA.
  - 2. Grade D Select (Quality) Idaho white, lodgepole, ponderosa, or sugar pine; NLGA or WWPA.
  - 3. Grade A Finish aspen, basswood, cottonwood, gum, magnolia, red alder, soft maple, sycamore, tupelo, or yellow poplar; NHLA.
- C. Moldings: Made to patterns included in WMMPA WM 7 and graded according to WMMPA WM 4.
  - 1. Moldings for Opaque (Painted) Finish: P-grade eastern white.

## 2.6 PLYWOOD BACKING PANELS

- A. Telephone and Electrical Equipment Backing Panels: DOC PS 1, Exposure 1, C-D Plugged, in thickness indicated or, if not indicated, not less than 1/2-inch (13-mm) nominal thickness.

## 2.7 FASTENERS

- A. General: Where carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners of Type 304 stainless steel.

- B. Power-Driven Fasteners: NES NER-272.
- C. Screws for Fastening to Cold-Formed Metal Framing: ASTM C 954, except with wafer heads and reamer wings, length as recommended by screw manufacturer for material being fastened.

## PART 3 - EXECUTION

### 3.1 INSTALLATION, GENERAL

- A. Set carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit carpentry to other construction; scribe and cope as needed for accurate fit. Locate nailers, blocking, and similar supports to comply with requirements for attaching other construction.
- B. Framing Standard: Comply with AF&PA's "Details for Conventional Wood Frame Construction," unless otherwise indicated.
- C. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.
- D. Securely attach carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
  - 1. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code.
- E. Wood Trim Installation: Install with minimum number of joints practical, using full-length pieces from maximum lengths of lumber available. Cope at returns and miter at corners to produce tight-fitting joints with full-surface contact throughout length of joint. Use scarf joints for end-to-end joints.
  - 1. Match color and grain pattern across joints.
  - 2. Install trim after gypsum board joint-finishing operations are completed.
  - 3. Install to tolerance of **1/8 inch in 96 inches (3 mm in 2438 mm)** for level and plumb. Install adjoining finish carpentry with **1/32-inch (0.8-mm)** maximum offset for flush installation and **1/16-inch (1.6-mm)** maximum offset for reveal installation.

### 3.2 PROTECTION

- A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION

**SECTION 072001**  
**BUILDING INSULATION**

**PART 1 – GENERAL**

**1.1 SECTION INCLUDES**

- A. Batt thermal insulation with or without facing.

**1.2 ENVIRONMENTAL REQUIREMENTS**

- A. Install insulation adhesives in accordance with manufacturer's instructions.

**PART 2 - PRODUCTS**

**2.1 INSULATION MATERIALS**

- A. Polystyrene Insulation: ASTM C578, extruded cellular type as manufactured by Styrofoam, or approved equal.
  - 1. Thermal Resistance: R of 10
  - 2. Thickness: 2"
  - 3. Compressive Strength: Minimum 30 psi.
  - 4. Water Absorption: In accordance with ANSI/ASTM D2842 0.3 percent by volume maximum.
  - 5. Edges: Shiplap.
- B. Batt Insulation: ASTM C665, Type 1; preformed glass fiber batt, with facing as manufactured by Certainteed, or approved, equal, and conforming to the following:
  - 1. Thermal Resistance: At 6" studs, minimum R=21; at 4" studs, minimum R-13, R-38 in attic, roof, and ceiling.
  - 2. Batt Size: To fit wall stud spacing.
  - 3. Facing: Faced with kraft paper, foil, or unfaced, as indicated.
  - 4. Overlap facing paper over studs and staple in place.
  - 5. Urea formaldehyde free binding agents.
- C. Non-expanding foam insulation: Apply on expanding foam insulation at window frame work and around other penetrations through the exterior wall. Test windows for complete operation. Do not void window warranty.

**2.2 ADHESIVES**

- A. Adhesive: Type recommended by insulation manufacturer for application.

**PART 3 - EXECUTION**

### 3.1 EXAMINATION

- A. Verify that substrate, adjacent materials, and insulation boards are dry and ready to receive insulation and adhesive.

### 3.2 INSTALLATION - BATT INSULATION

- A. Install insulation with integral vapor barrier in accordance with insulation manufacturer's instructions.
- B. Install in attic joist spaces without gaps or voids. Fitting batts - cut batts 1 inch longer than stud cavity. Cut batts ½-inch wider than non-standard width stud bays to provide snug fit.
- C. Fit insulation tight in spaces. Leave no gaps or voids.
- D. Exterior corners fully insulated - where corner studs create inaccessible void, insulate prior to erecting. (Note: drywall clips can obviate need for third stud.)

### 3.4 SCHEDULE OF INSULATION

- B. Ceiling Insulation: R38 kraft-faced fiberglass insulation batts.
- C. Stud Wall Insulation: R13 (minimum) at 2 x 4's and R21 (minimum) at 2 x 6's, roll, faced.

END OF SECTION

## **SECTION 072500**

### **VAPOR BARRIERS**

#### **PART 1 - GENERAL**

##### **1.1 PRODUCTS**

- A. Vinyl Film Vapor Barrier: 10-mil virgin polyolefin resins film rated 0.036 perms or less. Class "A" per ASTM E 1745, ASTM E 96 and ASTM F 1249.

#### **PART 2 – EXECUTION**

##### **2.1 INSTALLATION**

- A. Adhesive Anchorage: Except where specifically indicated to be penetrated with fasteners or other anchorage devices, install vapor barriers with adhesives or self-adhesive tape of type recommended by vapor barrier manufacturer to seal all radon gas and vapors.
- B. Anchorage: Install vapor barriers with adhesive or fasteners as appropriate for supporting substrate, and of type recommended by vapor barrier manufacturer.
- C. Provide lapped seams and lap vapor barriers onto other work at edges of coverages and at penetrations of barriers by other work.
- D. Seal lapped seams and laps onto other work with adhesive or self-adhesive tape of type recommended by vapor barrier manufacturer. Before covering over vapor barriers with other (concealing) work, patch punctures and tears with adhesively applied barrier material or tape with perm rating equal to barrier rating.

**END OF SECTION**

**SECTION 079200**  
**JOINT SEALANTS**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. This Section includes joint sealants for the following applications, including those specified by reference to this Section: following applications:
  - 1. Exterior joints in vertical surfaces and horizontal nontraffic surfaces.
  - 2. Interior joints in vertical surfaces and horizontal nontraffic surfaces.

**1.2 PERFORMANCE REQUIREMENTS**

- A. Provide elastomeric joint sealants that establish and maintain watertight and airtight continuous joint seals without staining or deteriorating joint substrates.
- B. Provide joint sealants for interior applications that establish and maintain airtight and water-resistant continuous joint seals without staining or deteriorating joint substrates.

**1.3 SUBMITTALS**

- A. Product Data: For each joint-sealant product indicated.
- B. Samples: For each type and color of joint sealant required, provide Samples with joint sealants in 1/2-inch- (13-mm-) wide joints formed between two 6-inch- (150-mm-) long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.
- C. Preconstruction field test reports.
- D. Compatibility and adhesion test reports.
- E. Product test reports.

**1.4 QUALITY ASSURANCE**

- A. Preconstruction Compatibility and Adhesion Testing: Submit samples of materials that will contact or affect joint sealants to joint-sealant manufacturers for testing according to ASTM C 1087 to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
- B. Preconstruction Field-Adhesion Testing: Before installing elastomeric sealants, field test their adhesion to Project joint substrates according to the method in ASTM C 1193 that is appropriate for the types of Project joints.

## 1.5 WARRANTY

- A. Special Installer's Warranty: Installer's standard form in which Installer agrees to repair or replace elastomeric joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

- 1. Warranty Period: Two years from date of Substantial Completion.

- B. Special Manufacturer's Warranty: Manufacturer's standard form in which elastomeric sealant manufacturer agrees to furnish elastomeric joint sealants to repair or replace those that do not comply with performance and other requirements specified in this Section within specified warranty period.

- 1. Warranty Period: Ten years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products listed in other Part 2 articles.

- B. Products: Subject to compliance with requirements, provide one of the products listed in other Part 2 articles.

### 2.2 MATERIALS, GENERAL

- A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer, based on testing and field experience.

- B. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

### 2.3 ELASTOMERIC JOINT SEALANTS

- A. Elastomeric Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied chemically curing sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.

- B. Stain-Test-Response Characteristics: Where elastomeric sealants are specified to be nonstaining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.

- C. Suitability for Immersion in Liquids. Where elastomeric sealants are indicated for Use I for joints that will be continuously immersed in liquids, provide products that have undergone testing according to ASTM C 1247 and qualify for the length of exposure indicated by reference to ASTM C 920 for Class 1 or 2. Liquid used for testing sealants is deionized water, unless otherwise indicated.
- D. Suitability for Contact with Food: Where elastomeric sealants are indicated for joints that will come in repeated contact with food, provide products that comply with 21 CFR 177.2600.
- E. Multi-Component Polyurethane:
  - 1. Products (or equivalent):
    - a. Tremco Dymeric 240 FC
    - b. Or equal
  - 2. Type and Grade: M (multi-component) and NS (non sag).
  - 3. Class: 50.
  - 4. Use Related to Exposure: NT (nontraffic).
  - 5. Uses Related to Joint Substrates: T, NT, M, A and O.
- F. Single-Component Mildew-Resistant Neutral-Curing Silicone Sealant:
  - 1. Products (or equivalent):
    - a. Pecora Corporation; 890.
    - b. Dow Corning; 790.
    - c. Or equal.
  - 2. Type and Grade: S (single component) and NS (nonsag).
  - 3. Class: 25.
  - 4. Use Related to Exposure: NT (nontraffic).
  - 5. Uses Related to Joint Substrates: M, G, A, and, as applicable to joint substrates indicated, O.

## 2.4 ACOUSTICAL JOINT SEALANTS

- A. Acoustical Sealant for Exposed and Concealed Joints: Manufacturer's standard nonsag, paintable, nonstaining 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.
  - 1. Products (or equivalent):
    - a. Pecora Corporation; AC-20 FTR Acoustical and Insulation Sealant.
    - b. United States Gypsum Co.; SHEETROCK Acoustical Sealant.
    - c. Or equal.
- B. Acoustical Sealant for Concealed Joints: Manufacturer's standard, nondrying,



nonhardening, nonskinning, nonstaining, gunnable, synthetic-rubber sealant recommended for sealing interior concealed joints to reduce airborne sound transmission.

1. Products (or equivalent):
  - a. Pecora Corporation; BA-98.
  - b. Tremco; Tremco Acoustical Sealant.
  - c. Or equal.

## 2.5 PREFORMED JOINT SEALANTS

- A. Preformed Silicone-Sealant System: Manufacturer's standard system consisting of precured low-modulus silicone extrusion, in sizes to fit joint widths indicated, combined with a neutral-curing silicone sealant for bonding extrusions to substrates.

1. Products (or equivalent):
  - a. Dow Corning Corporation; 123 Silicone Seal.
  - b. GE Silicones; UltraSpan US 1100.
  - c. Pecora Corporation; Sil-Span.
  - d. Tremco; Spectrem Ez Seal.
  - e. Or equal.

- B. Preformed Foam Sealant: Manufacturer's standard mildew-resistant, nonmigratory, nonstaining, preformed, precompressed, open-cell foam sealant that is manufactured from high-density urethane foam impregnated with a nondrying, water-repellent agent.

1. Products (or equivalent):
  - a. EMSEAL Joint Systems, Ltd.; Emseal25V.
  - b. illbruck Sealant Systems, Inc.; Wilseal 600.
  - c. Polytite Manufacturing Corporation; Polytite B.
  - d. Polytite Manufacturing Corporation; Polytite Standard.
  - e. Sandell Manufacturi11g Co., Inc.; Polyseal.
  - f. Density: Manufacturer's standard 5.5 to 6.5 lb/cu. ft. (90 to 110 kg/cu. m).

## 2.6 JOINT-SEALANT BACKING

- A. General: Provide sealant backings of material and type that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin), and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance:

- C. Elastomeric Tubing Sealant Backings: Neoprene, butyl, EPDM, or silicone tubing complying with ASTM D 1056, nonabsorbent to water and gas, and capable of remaining resilient at temperatures down to minus 26 deg F (minus 32 deg C). Provide products with low compression set and of size and shape to provide a secondary seal, to control sealant depth, and to otherwise contribute to optimum sealant performance.
- D. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

## 2.7 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.
- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

## PART 3 - EXECUTION

### **DO NOT INSTALL BELOW 40° F**

## 3.1 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants.
  - 1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant.
    - a. Clean porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air.
  - 2. Remove laitance and form-release agents from concrete.
    - a. Clean nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of *joint* sealants.

- B. Joint Priming: Prime joint substrates, where recommended in writing by joint-sealant manufacturer, based on preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.
- C. Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

### 3.2 INSTALLATION

- A. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- B. Acoustical Sealant Application Standard: Comply with recommendations in ASTM C 919 for use of joint sealants in acoustical applications as applicable to materials, applications, and conditions indicated.
- C. Install sealant backings of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
  - 1. Do not leave gaps between ends of sealant backings.
  - 2. Do not stretch, twist, puncture, or tear sealant backings.
  - 3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.
- D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
- D. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
  - 1. Place sealants so they directly contact and fully wet joint substrates.
  - 2. Completely fill recesses in each joint configuration.
  - 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- F. Tooling of Non sag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
  - 1. Remove excess sealant from surfaces adjacent to joints.

2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
  3. Provide concave joint configuration per Figure 5A in ASTM C 1193, unless otherwise indicated.
- G. Installation of Preformed Silicone-Sealant System: Comply with manufacturer's written instructions.
- H. Installation of Preformed Foam Sealants: Install each length of sealant immediately after removing protective wrapping, taking care not to pull or stretch material, producing seal continuity at ends, turns, and intersections of joints. For applications at low ambient temperatures where expansion of sealant requires acceleration to produce seal, apply heat to sealant in compliance with sealant manufacturer's written instructions.
- I. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

END OF SECTION

## **SECTION 080671**

### **DOOR HARDWARE**

#### **PART 1 - GENERAL**

##### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of contract, including general and supplementary conditions and division 1 specifications, apply to this section.

##### **1.2 SUMMARY OF WORK INCLUDED**

- A. Sections "General Conditions", "Special Requirements" and "General Requirements" form a part of this section by this reference thereto and shall have the same force and effect as if printed herewith in full.
- B. Furnish, deliver, and coordinate all mechanical and electronic finish hardware as indicated, specified and required. Include all hardware under this section that is not specified in other sections, whether or not such hardware is scheduled herein, and include all trim, attachments and fastenings specified or required for proper and complete installation for given application. Items of hardware (specifically, mounting accessories required by door or frame details and required to properly install hardware and have it function properly and in conjunction with specified interacting hardware) not definitely specified herein and necessary for completion of the work shall be provided. Such items shall be of type and quality suitable to the service required and comparable to adjacent hardware. Where size and shape of member is such as to prevent the use of types specified, hardware shall be furnished of suitable types having as nearly as practicable the same operation and quality as the type specified.
- C. Type: Typical finish hardware required includes the following:
  - 1. Hinges
  - 2. Lock cylinders and keys
  - 3. Lock and Latchsets
  - 4. Bolts
  - 5. Exit Devices
  - 6. Push/pull handles and plates/ kickplates
  - 7. Closers
  - 8. Overhead holders
  - 9. Door trim
  - 10. Seals, including Astragals or meeting seals on door pairs
  - 11. Weather-stripping for exterior doors
  - 12. Thresholds
  - 13. Security products and Misc. Items
  - 14. Electrical and electronic materials and systems

##### **1.3 RELATED WORK SPECIFIED ELSEWHERE**

A. Specifications sections directly related shall be effectively coordinated:

1. Metal Doors and Frames: Section 081113

#### 1.4 REFERENCES

A. Documents and Institutes that shall be used in estimating, detailing and installing the items specified.

1. BHMA A156 – Builders Hardware Manufacturers Association
2. ANSI A117.1 – American National Standard Institute
3. NFPA 80 – Fire Doors and Windows 1999 Edition
4. NFPA 101 – Life Safety Code 2000Edition
5. NFPA 105 – Installation of Smoke Control Door Assemblies 1993 Edition
6. Local and State Building Codes
7. Underwriters Label for Fire Rated Doors and Assemblies
8. Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames
9. Door Hardware Institute (DHI); 1990
10. Specifications for Making Buildings and Facilities Accessible to And Usable by Physically Challenged People CABO/ANSI A117.1 – 1999

#### 1.5 SUBMITTALS

A. Manufacturer: Products of finish hardware supplied shall be selected from manufacturers mentioned in this document as approved by the architect/owner's representative prior to bid date.

B. Suppliers shall be recognized architectural finish hardware suppliers, with warehousing facilities who have been furnishing hardware in the projects vicinity for a period of not less than 2 years and who is or employs an experienced A.H.C. (or equal experience and technical skills), who is available at reasonable times during the course of the work for consultation about products, hardware requirements, to owner, professional, contractor or other contracted party.

C. Installer Qualifications: Must be qualified to install all Builders Hardware to the extent that all hardware is installed and properly operates to the manufacturers standards; including operational, functional, within dimensional parameters, to the manufacturer's templates, and strictly within the guidelines offered by manufacturer's product's instructions. Final adjustment shall be responsibility of installer, and shall be within tolerances as set by the product manufacturer's guidelines, both written and verbal, if applicable.

D. Product Data: Manufacturer's data for each different piece of hardware, with installation instructions. Two (2) complete sets of catalog cuts shall accompany the finish hardware schedule. The list of cuts shall include the item, manufacturer, and item number.

E. Hardware Schedule: Show manufacturer's complete identification for every item for every door.

1. Supplier shall submit three (3) copies of a complete hardware schedule referencing location of door, by door number, room number, corridor number, exterior or interior, door size, door swing, door and frame type, and any more significant information required for the professional to identify door, frame, hardware, and any other pertinent information required to evaluate compliance of materials. As noted below, only a vertical type hardware schedule shall be deemed acceptable.
2. Cross-reference to item names and designations in contract documents.
3. Indicate door/frame materials and sizes.
4. Explain number codes and abbreviations.
5. Indicate hardware mounting heights or locations, if different from those specified or if not specified.
6. Indicate finish for each item.
7. Preliminary schedule will be reviewed and accompanied by product data.
8. Provide Door and Hardware Institute's format vertical type hardware schedule showing door number, location, to and from rooms, swing of door, and list all hardware provided for that specific door type of operation. Horizontal type hardware schedules shall not be considered due to the cross-referencing required.

F. Keying Schedule:

1. Supplier required to meet with owner to finalize keying requirements and to propose final instructions in writing for owner's approval. Upon approval supplier shall prepare a final keying schematic chart and a listing of all key changes by door and lock showing all levels of keyed cylinders and approved expansion, and furnish to owner in duplicate. Construction keyed or temporary cores shall be furnished as required by the owner's representative during the construction phase.

G. Operation and Maintenance Data: For operating parts and finishes.

1. Supplier shall furnish manufacturer's maintenance and parts manuals (as available from manufacturers) for all hardware items furnished. Manuals shall be delivered to owner's representative prior to project closeout.

## 1.6 QUALITY ASSURANCE

- A. The quality of all items of hardware has been clearly indicated by the manufacturer's name and/or product number. Certain products are specified without substitution, and shall be furnished as specified. Requests for substitution must be in writing, submitted through a bidding contractor and received by the architect at least 10 days prior to bid date. The acceptance of any substitution shall be by addendum. Quality levels as specified herein shall be assured and warranted by the supplier.
1. Single source responsibility: Obtain each type of hardware (locksets, exit devices and closers) from a single manufacturer.

## 1.7 PROJECT CONDITIONS

- A. Sequence submittal of hardware schedule and door and frame submittals, allowing adequate time for review and resubmittals, if required, so that construction is not delayed; provide adequate information for review.
- B. Provide hardware installation templates to installers of hardware and to fabricators of other work, which is required to be prepared in the shop or factory for hardware installation.
- C. Coordinate shop drawings of other work so that proper preparation is made. Coordination of the following trades shall be included as applicable.
  - 1. Wood Door Manufacturer.
  - 2. Hollow Metal Manufacturer
  - 3. Aluminum manufacturer and/or supplier
  - 4. Electrical (and associated trades such as Security and Alarms) where electronic hardware is specified

## 1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver hardware at the times and to the locations required for timely installation.
- B. Provide a locked storage area controlled by the contractor for hardware not yet installed; take special care to prevent loss of long-lead items.

## 1.9 MAINTENANCE

- A. Provide all adjustment and maintenance tools recommended by hardware manufacturers.
- B. Final adjustment shall be responsibility of installer, and shall be within tolerances as set by the product manufacturer's guidelines and templates, both written and verbal, if applicable. It is the responsibility of the aluminum installer / supplier to make all adjustments to the hardware, installed on their doors and frames, for a period of one year from installation. All other adjustments to hardware on the project shall be the responsibility of the General Contractors Installer for a period of one year from installation.

## PART 2 - PRODUCTS

- A. In addition to requirements of the hardware schedule, comply with the requirements below.

## 2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements of all previous sections and conditions; manufacturers (or suppliers) offering products that may



be incorporated in this work shall be as approved by addendum by Architect. Requests for substitution shall be made in writing to Architect with sufficient product details, cross-references testing data, and any additional supportive materials (including samples if required) as Architect shall require.

1. Butts and Hinges(or equivalent).
  - a. McKinney Manufacturing Co (Assa Abloy)
  - b. Stanley Hardware
  - c. YKK AP
  - d. Bommer Manufacturing
  - e. Ives (Ingersoll-Rand)
  - f. Hager
2. Pivots (or equivalent):
  - a. Rixon (Assa Abloy)
  - b. Glynn- Johnson (Ingersoll-Rand)
3. Cylinders (or equivalent) - Furnished as a new key system by supplier.
  - a. Yale (Assa Abloy)
  - b. Corbin-Russwin (Assa Abloy)
  - c. Sargent (Assa Abloy)
  - d. Schlage (Ingersoll-Rand)
  - e. Falcon (Ingersoll-Rand)
4. Cylindrical Locks (or equivalent):
  - a. Yale PB5400LN, PB5300LN & PB4300LN (Assa Abloy)
  - b. Corbin Russwin, CL3300PZD, CL3900PZD, CL3300PZD (Assa Abloy)
  - c. Sargent 10G LP, 7GLP (Assa Abloy)
  - d. Schlage ND Series , AL Series, S Series , F Series ( Ingersoll-Rand)
  - e. Falcon T Series, B Series, W Series, Y Series (Ingersoll-Rand)
5. Wall & Floor Stops (or equivalent):
  - a. Trimco (Assa Abloy)
  - b. Rockwood Manufacturing Co.
  - c. Burns Manufacturing
  - d. Ives ( Ingersoll-Rand)
6. Overhead Stops (or equivalent):
  - a. Trimco Manufacturing (Assa Abloy)
  - b. Sargent (Assa Abloy)
  - c. Glynn-Johnson (Ingersoll-Rand)
7. Exit Devices and Trim (or equivalent):
  - a. Yale 70000 x PB600F Series 605 (Assa Abloy)
  - b. Corbin Russwin ED 5000S x PR900 Series 605 (Assa Abloy)
  - c. Sargent 80 x ETP series x 605 (Assa Abloy)
  - d. Von Duprin 98/99 series x 996L Trim
  - e. Monarch 18 Series Device and 18 XX Series Trim (Ingersoll-Rand)
8. Surface Closers (or equivalent):
  - a. Norton Door Controls 7500BF ALUM (Assa Abloy)
  - b. Corbin Russwin DC2200 ALUM (Assa Abloy)
  - c. Sargent 351 ALUM (Assa Abloy)

- d. LCN 4000 Series, 1000 Series (CAST IRON) (Ingersoll-Rand)
- e. Dor-o-matic SC70 Series, SC80 Series ALUM Ingersoll-Rand)
- 9. Flat Goods (or equivalent):
  - a. Trimco (Assa Abloy)
  - b. Rockwood Manufacturing Co.
  - c. Burns Manufacturing
  - d. Ives (Ingersoll-Rand)

## 2.2 SCHEDULED HARDWARE

- A. Requirements for design, grade, function, finish, size and other distinctive qualities of each type of finish hardware are indicated in the "Hardware Sets" at the end of this section. Products are identified by using hardware designation numbers of the following:
  - 1. Manufacturers Product Designations: The product designation and name is listed for each type of hardware. Provide either the product designated or where more than one manufacturer is specified in part 2 under the article "Manufacturers" for each hardware type, the comparable product of one of the manufacturers.

## 2.3 MATERIALS AND FABRICATION

- A. Manufacturer's Names and Trade Names: Display of names, logos, or other identification is acceptable on lock or hinge edge of door, but not where visible on either face of door.
  - 1. Exception: As directed by or acceptable to the architect.
  - 2. Exception: Manufacturer's name or other identification on face of lock cylinders.
- B. Fasteners: Provide hardware prepared by the manufacturer with fastener holes for machine screws, unless otherwise indicated.
  - 1. Provide all fasteners required for secure installation. Utilize concealed fasteners wherever possible. Where through bolts are utilized, provide finish-threaded caps to fully conceal nuts.
    - a. Select fasteners appropriate to substrate and material being fastened.
  - 2. Use Flathead Phillips screws unless otherwise indicated. - At all secure areas provide security fasteners (Security head) of same type.
  - 3. Use wood screws or through bolts dependent on wood door and hardware manufacturer's requirements for installation in wood.
  - 4. Use fasteners impervious to corrosion outdoors and on exterior doors.
  - 5. Self-drilling "Tek" type screws are not acceptable. Use only fasteners supplied by hardware manufacturer.
  - 6. Where it is not possible to reinforce substrate adequately for screws, use through-bolts with sleeves or use sex bolts.

- a. Do not use where head or nut would be exposed on face of door, unless specifically indicated or made necessary by other requirements.
- b. Finish exposed heads and nuts the same as hardware on that side of the door.

7. Use expansion shield anchors in concrete and masonry.

## 2.4 HINGES, BUTTS, CONTINUOUS HINGES AND PIVOTS

### A. Manufacturers:

- 1. Provide products complying with requirements of the contract document. Acceptable products shall be as specifically listed in the hardware sets herein by manufacturer's number and series. Provide either the product designated or where more than one manufacturer is specified in part 2, under the article "Manufacturers" for each hardware type, the comparable product of one of the manufacturers.

### B. Butt Hinges: American made five-knuckle, exposed tip butt hinges.

- 1. Comply with applicable requirements of BHMA A156.1.
- 2. Use heavy weight hinges where scheduled at high frequency entrances.
- 3. Use full mortise hinges unless otherwise specified.
- 4. Dimensions: As indicated, within limits prescribed by ANSI/BHMA A 156.7.
  - a. Size(s): As prescribed by ANSI/BHMA A 156.7. - Finish as specified.
  - b. Size hinges to suit thickness of door, including applied facings.
  - c. Provide non-removable pins or safety studs for out-swinging doors with keyed lock or exit function.
  - a. Quantity: Provide minimum of 3 hinges or pivots on each door for doors up to and including 90". Add one additional hinge or Pivot for each 30" height increment increase.

### C. Pivots - Provide type as specified in hardware sets.

## 2.5 LOCKS, LATCHES, AND BOLTS

### A. Manufacturers:

#### 1. Locksets, Latchsets, and Exit Devices:

- a. Provide products complying with requirements of the contract document. Acceptable products shall be as specifically listed herein by manufacturer's number and series.
- b. All locksets shall be as listed in hardware sets. Neither plastic inserts nor tubular levers shall be furnished in the either levers or latches. All locksets shall be furnished with solid lever handles.

- c. All cylindrical lever locksets shall feature a freewheeling locking mechanism to help extend the life of the lock and reduce maintenance.
  - d. Provide copy of 1 year written warranty for all cylindrical locksets when submitting hardware schedule for architect's approval.
- 2. Exit Devices: All exit devices for this project shall carry a written five-year manufacturer warranty. Provide copy of warranty when submitting hardware schedule for architect's approval. Use devices of only one manufacturer. All exit devices shall be provided with a guarded main latch. Standard (pullman, or other non-guarded) type latches (rim, vertical rod, or mortise device) lacking guard, shall not be acceptable.
  - a. At hollow metal, wood doors or wide stile doors provide wide stile exit devices (with spacers as required) to clear raised trim as required by door details.
  - b. Locate exit devices at vertical location on door per architect's instructions at those doors where multiple lites occur to offer horizontal lines as per architect's design intent. Exit devices on doors with center cross rail shall be mounted centerline in rail.
  - c. Comply with requirements of BHMA A156.3, Grade 1.
  - d. Style: Modern push-pad type, narrow stile or wide stile as scheduled. Where scheduled, provide security type exit device from either of the manufacturers listed. Standard exit devices utilizing Pullman type latches shall not be acceptable where security exit devices are scheduled. Only active case heads utilizing an interlocked guarded and main latch shall be acceptable.
  - e. All exposed materials shall be architectural grade metals. Neither white metals, nor plastic shall be acceptable on any exposed surface.
  - f. Outside trim: All lever trim at exit devices, except where indicated as rigid dummy trim, shall be furnished with either breakaway or clutch-type freewheeling levers for durability and longevity.
  - g. Where cylinder only or where 121NL is indicated, provide outside trim employing a cylinder and cylinder collar only. This function (ANSI F03) shall result in key retraction of latchbolt.
  - h. All devices shall be supplied with Extra Heavy Duty Lever Release Trim. Trim shall have ramped (beveled) sides and a flush cylinder to resist abuse and extend the product life.
  - i. Locate exit devices at vertical location on door per architect's instructions at those doors where multiple lites occur to offer horizontal lines as per architect's design intent.
- 3. Flush bolts: Lever-extension flush bolts complying with BHMA A156.16, Grade 1.
  - a. Manual:
    - 1) Lower actuator centered 12 inches from door bottom;

- upper actuator centered 72 inches from door bottom. All flushbolts shall be furnished with stainless steel actuating fingers for durability.
    - 2) All flushbolts shall be furnished with dustproof strikes and mounting plates as required to secure to finished floor.
  - b. Automatic:
    - 1) All automatic flushbolts shall operate and function efficiently and smoothly when door closers are adjusted to meet and comply with ADA and Barrier Free closing and opening forces. Units that require door closers to be excessively adjusted to operate are not acceptable.
- 4. Strikes: Provide strike for each latch bolt and lock bolt.
  - a. Finish to match other hardware on door.
  - b. Use wrought box strikes with curved lips unless otherwise indicated.
  - c. Open strike plates may be used on interior wood
  - d. In floors, use dustproof strikes unless threshold is supplied and strike hole shall be provided with clean and dimensionally correct bolthole.
  - e. At all pairs of doors requiring astragals, strikes shall be furnished such that lip of strike is flush with door edge and will not interfere with a flush astragal condition when active door is in a closed position, or astragal shall be coped around strike lip for proper operation of astragal.

## 2.6 LOCK CYLINDERS AND KEYING

- A. Keying:
  - 1. Keying shall be into a new master key system. Contractor may require temporary cores or temporary locks during construction phase for usage and lock-up. Furnish temporaries, as contractor requires.
  - 2. Architectural Grade Locksets and cylinders: Provide products complying with requirements of the contract documents
- B. Keys - Architectural:
  - 1. All keys to be stamped "Do Not Duplicate" and key code number as set by the factory.
  - 2. Provide 6 masterkeys, 4 copies each key change, 6 CMK & 100 each extra stamped *Do Not Duplicate* key blanks for owner's use. – Deliver all final keys and key blanks directly to owner's representative.

## 2.7 DOOR CONTROL DEVICES

### A. Manufacturers:

1. Provide products complying with requirements of the contract document. Acceptable products shall be as specifically listed herein by manufacturer's number and series.
2. Wall and floor-mounted stops and holders: Provide products complying with requirements of the contract documents and made by one of the following:

### B. Closers - General: Provide metal, plastic, painted or plated door closers as schedule indicates.

1. Use closers of sizes recommended by manufacturer, unless a larger size is specified. All closer for this project to carry a minimum written "10 Year Warranty". All closers shall be manufactured in the USA of domestic metals, and supplied with a 1 ½" diameter piston.
2. Size closer or adjust closer opening force to comply with applicable codes. Furnish barrier free compliant door closer at all interior doors, whether listed specifically in hardware sets or not. Furnish all brackets and drop plates required to affix door closers as scheduled according to specific door top rails and frame face dimensions, whether listed in hardware specification or not.
3. Provide door closer mounting brackets, arms, plates, and misc. equipment as necessary to mount all door closers inside room, or out of corridor at every instance where a door closer is specified. No door closers (nor parts, nor accessories of) shall be visible from corridor side unless architect has authorized specific and formal approval for that mounting application, and has clear understanding closer is visible through lite, and has approved such. Provide top jamb mounted units where hardware schedule lists closer functions that are not available in regular arm mounting configurations.

### C. Surface-Mounted, Concealed Closers and auto operated low power closers:

1. Comply with requirements of BHMA A156.4, Grade 1. Provide the following features:
  - a. Warranty - Lifetime of body and 10 Year written warranty on parts on all closers.
  - b. Adjustable hydraulic back check and barrier free closers at all doors.
  - c. Style: Modern with cover.
  - d. Parallel arms: Provide for all closers; use larger size than normal.
  - e. Provide manual hold-open feature as specified.
  - f. Unitrol door closers - provide spring-loaded spring-stop, spring Cush or Unitrol arm where specified. Provide arm-mounting accessories as required to properly secure Unitrol arm 6190, 2022 or 6191 kits shall be furnished where Unitrol door closers - provide spring-loaded spring-stop, spring Cush or Unitrol arm

where specified. Provide arm-mounting accessories as required too properly secure Unitrol arm. 6190, 2022 or 6191 kits shall be furnished where dimensions require. An alternative closer and overhead stop may be furnished in lieu of the Unitrol specified. Furnish closer as scheduled used in conjunction with Rixson #1 overhead stop where Unitrol type closer is scheduled and supplier desires an alternate substitution.

- g. Finish: All door closers to be finished in metallic powder coated paint finish, similar to metal hardware on same door. All covers screws and arms are to be plated to match adjacent hardware.

D. Wall/Floor-Mounted Stops/Holders: Comply with requirements of ANSI A156.16.

- 1. Resilient bumpers: Trimco 1229A silencers shall be furnished at all hollow metal and wood frames whether scheduled in hardware sets or not. Each single door to be supplied with three (3) each. Each double opening shall be furnished with two (2) each. Exceptions: Exterior doors and sound sealed doors.

## 2.8 ARCHITECTURAL DOOR TRIM

A. Manufacturers:

- 1. Architectural door trim: Provide products complying with requirements of the contract documents. Products submitted shall meet requirements as specified herein and shall be designated by manufacturer's number and series.

## 2.9 SEALS

A. Manufacturers:

- 1. Seals: Provide products complying with requirements of the contract document. Acceptable products shall be as specifically listed herein by manufacturer's number and series.

B. Seals:

- 1. At jambs and head: As scheduled.
- 2. At bottom: As scheduled.
- 3. Housing finish: as scheduled.
- 4. Silicon or neoprene as scheduled adhered with self-adhesive, or mechanically fastened, shall be UL fire listed and provided as scheduled. Provide as listed in schedule, door schedule, and floor plans and as is typical of the balance of scheduled hardware as indicated by and thus required by usage of rooms.

## 2.11 FINISHES

- A. Finish on All Exposed Metal Items: All finishes must match finish as listed in the Hardware sets. Supply similar painted finish only at typical painted hardware materials.
- B. Exceptions:
  - 1. At all exterior, wet or moisture-laden areas use hinges of nonferrous base metal, whether scheduled herein or not. Where specified, use Stainless Steel. At all painted finishes at wet areas (pool, exercise and at exterior) use rust resistant paint (SRI) or paint must be powder coated type to assure superior paint performance at these areas.
  - 2. Items specified with the same finish shall match as closely as possible using standard manufactured products.
  - 3. Provide finishes matching BHMA A156.18 designations.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Non-fire-rated wood doors and wood frames may be field-prepared for installation; all other types of doors and frames are to be factory- or shop-prepared.

### 3.2 INSTALLATION

- A. Follow hardware manufacturer's recommendations and instructions.
- B. Provide the services of an architectural hardware consultant to advise on proper installation, to inspect the finished work, and either to adjust or to instruct those who are adjusting.
- C. Install surface-mounted items after substrates have been completely finished; install recessed items and recessed portions of items before finishes are applied and provide suitable, effective protection.
  - 1. When surface-mounted items are installed before final finish, remove, store, and reinstall, or apply suitable effective protection.
- D. Mount at heights specified in the Door and Hardware Institute's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
- E. Install hardware in correct location, plumb and level.
- F. Reinforce substrates as required for secure attachment and proper operation.
- G. Thresholds: Apply continuous bead of sealant to all contact surfaces before



installing.

### 3.3 ADJUSTMENT

- A. It shall be the supplier's responsibility to be available to Installers and/or owner's representative to council and demonstrate proper hardware adjustment prior to job closeout. Supplier shall offer on-site instruction of all final adjustment if so required by the installers or owners representative. Final adjustment shall result in performance, function and operation, as manufacturer shall deem sufficient to have full warranty coverage for the time as specified herein. Project installers shall adjust each operable unit for correct function and smooth, free operation to manufacturer's required operational and functional qualitative level of performance. Readjust hardware not more than one week before substantial completion.
- B. Adjust door closers to overcome air pressure produced by HVAC systems. If HVAC pressure, whether negative or positive, negates proper operation or function of any closing or latching device, or inhibits manufacturer's intended performance (in any manner), supplier shall inform the GC in writing that type of hardware cannot operate nor function as manufacturer has designed and tested due to HVAC condition.

### 3.4 INSTRUCTION OF OWNER'S PERSONNEL

- A. Instruct the Owner's personnel in operation and maintenance of hardware, including finishes.

### 3.5 CLEANING

- A. Clean hardware; clean other work soiled during hardware installation.

### 3.6 CONTRACT CLOSEOUT

- A. Deliver all Bitting List, keys, and extra blanks to the Owner.
- B. Contractor to furnish a binder, delivered to the owner or the owners rep, complete with:
  - 1. Manufacturer's data for each different piece of hardware (Catalog sections).
  - 2. One set of complete installation instructions of each piece of hardware furnished.
  - 3. Most recent hardware schedule, complete with all changes.
  - 4. Two complete set of Wiring diagrams (riser diagrams) per door, and door # with all supplied hardware shown.
  - 5. Deliver complete Bitting list for all locks furnished on the project.
  - 6. Provide all adjustment and maintenance tools recommended by hardware manufacturers.
  - 7. Provide copy of one-year warranty for locks, five-year for exit devices and

ten-year warranty for closers.

### 3.7 HARDWARE SETS

Refer to door schedule for number and location.  
Manufacturers as listed, or equivalent.

#### Hardware Set 001

Existing 3'-0" x 6'-8" Steel Door and HM Frame - RHR

No work

#### Hardware Set 002

Existing Double 3'-0" x 6'-8" Steel Door and HM Frame

No work

#### Hardware Set 003

Single 3'-0" x 6'-8" Solid Wood Door and HM Frame - RH

1	ea	Lockset	Flacon W561-Dane	US26D
3	ea	Hinge	Hager BB1191	US26D
3	ea	Silencers	Ives SR64	Rubber
2	ea	Kick Plates	Rockwood K4125 8"x34"	Clear Plastic

#### Hardware Set 004

Existing Single 3'-0" x 6'-8" Steel Door and HM Frame - RHR

No work

#### Hardware Set 005

Existing Single 3'-0" x 6'-8" Steel Door and HM Frame - LHR

No work

#### Hardware Set 006

Single 3'-0" x 6'-8" Solid Wood Door and HM Frame - LH

1	ea	Lockset	Flacon W561-Dane	US26D
3	ea	Hinge	Hager BB1191	US26D
3	ea	Silencers	Ives SR64	Rubber
2	ea	Kick Plates	Rockwood K4125 8"x34"	Clear Plastic

#### Hardware Set 007

Single 3'-0" x 6'-8" Solid Wood Door and HM Frame - RH

1	ea	Lockset	Flacon W571-Dane	US26D
3	ea	Hinge	Hager BB1191	US26D
3	ea	Silencers	Ives SR64	Rubber
2	ea	Kick Plates	Rockwood K4125 8"x34"	Clear Plastic

#### Hardware Set 008

Single 3'-0" x 6'-8" Solid Wood Door and HM Frame - RH

1	ea	Lockset	Flacon W561-Dane	US26D
3	ea	Hinge	Hager BB1191	US26D
3	ea	Silencers	Ives SR64	Rubber
2	ea	Kick Plates	Rockwood K4125 8"x34"	Clear Plastic

#### Hardware Set 009

Single 4'-0" x 6'-8" Solid Wood Door and HM Frame - RHR

1	ea	Lockset	Flacon W571-Dane	US26D
3	ea	Hinge	Hager BB1191	US26D
3	ea	Silencers	Ives SR64	Rubber
2	ea	Kick Plates	Rockwood K4125 8"x34"	Clear Plastic

#### Hardware Set 010

Existing Overhead Electrical Gate

No Work

#### Hardware Set 011

Single 3'-0" x 6'-8" Solid Wood Door and HM Frame - LH

1	ea	Lockset	Flacon W301-Dane	US26D
3	ea	Hinge	Hager BB1191	US26D
3	ea	Silencers	Ives SR64	Rubber
2	ea	Kick Plates	Rockwood K4125 8"x34"	Clear Plastic
1	ea	Threshold	Marble – 4"	-

#### Hardware Set 012

Single 3'-0" x 6'-8" Solid Wood Door and HM Frame - RH

1	ea	Lockset	Flacon W301-Dane	US26D
3	ea	Hinge	Hager BB1191	US26D
3	ea	Silencers	Ives SR64	Rubber
2	ea	Kick Plates	Rockwood K4125 8"x34"	Clear Plastic
1	ea	Threshold	Marble – 4"	-

#### **Hardware Set 013**

Single 3'-0" x 6'-8" Solid Wood Door and HM Frame - RHR

1	ea	Lockset	Flacon W561-Dane	US26D
3	ea	Hinge	Hager BB1191	US26D
3	ea	Silencers	Ives SR64	Rubber
2	ea	Kick Plates	Rockwood K4125 8"x34"	Clear Plastic

#### **Hardware Set 014**

Single 3'-0" x 6'-8" Solid Wood Door and HM Frame - RHR

1	ea	Lockset	Flacon W561-Dane	US26D
3	ea	Hinge	Hager BB1191	US26D
3	ea	Silencers	Ives SR64	Rubber
2	ea	Kick Plates	Rockwood K4125 8"x34"	Clear Plastic

#### **Hardware Set 100**

Single 3'-0" x 6'-8" Solid Wood Door and HM Frame - RH

1	ea	Lockset	Flacon W571-Dane	US26D
3	ea	Hinge	Hager BB1191	US26D
3	ea	Silencers	Ives SR64	Rubber
2	ea	Kick Plates	Rockwood K4125 8"x34"	Clear Plastic

#### **Hardware Set 101**

Single 3'-0" x 6'-8" Solid Wood Door and HM Frame - LH

1	ea	Lockset	Flacon W571-Dane	US26D
3	ea	Hinge	Hager BB1191	US26D
3	ea	Silencers	Ives SR64	Rubber
2	ea	Kick Plates	Rockwood K4125 8"x34"	Clear Plastic

#### **Hardware Set 102**

Single 3'-0" x 6'-8" Solid Wood Door and HM Frame - LH

1	ea	Lockset	Flacon W571-Dane	US26D
3	ea	Hinge	Hager BB1191	US26D
3	ea	Silencers	Ives SR64	Rubber
2	ea	Kick Plates	Rockwood K4125 8"x34"	Clear Plastic

#### **Hardware Set 103**

Single 3'-0" x 6'-8" Solid Wood Door and HM Frame - LH

1	ea	Lockset	Flacon W571-Dane	US26D
3	ea	Hinge	Hager BB1191	US26D
3	ea	Silencers	Ives SR64	Rubber
2	ea	Kick Plates	Rockwood K4125 8"x34"	Clear Plastic

#### Hardware Set 104

Single 3'-0" x 6'-8" Solid Wood Door and HM Frame - LH

1	ea	Lockset	Flacon W571-Dane	US26D
3	ea	Hinge	Hager BB1191	US26D
3	ea	Silencers	Ives SR64	Rubber
2	ea	Kick Plates	Rockwood K4125 8"x34"	Clear Plastic

#### Hardware Set 105

Single 3'-0" x 6'-8" Solid Wood Door and HM Frame - RH

1	ea	Lockset	Flacon W561-Dane	US26D
3	ea	Hinge	Hager BB1191	US26D
3	ea	Silencers	Ives SR64	Rubber
2	ea	Kick Plates	Rockwood K4125 8"x34"	Clear Plastic

#### Hardware Set 106

Single 3'-0" x 6'-8" Solid Wood Door and HM Frame - LH

1	ea	Lockset	Flacon W571-Dane	US26D
3	ea	Hinge	Hager BB1191	US26D
3	ea	Silencers	Ives SR64	Rubber
2	ea	Kick Plates	Rockwood K4125 8"x34"	Clear Plastic

#### Hardware Set 107

Single 3'-0" x 6'-8" Solid Wood Door and HM Frame - LH

1	ea	Lockset	Flacon W571-Dane	US26D
3	ea	Hinge	Hager BB1191	US26D
3	ea	Silencers	Ives SR64	Rubber
2	ea	Kick Plates	Rockwood K4125 8"x34"	Clear Plastic

#### Hardware Set 108

Single 3'-0" x 6'-8" Solid Wood Door and HM Frame - LH

1	ea	Lockset	Flacon W571-Dane	US26D
3	ea	Hinge	Hager BB1191	US26D
3	ea	Silencers	Ives SR64	Rubber
2	ea	Kick Plates	Rockwood K4125 8"x34"	Clear Plastic

### Hardware Set 109

Single 3'-0" x 6'-8" Solid Wood Door and HM Frame - LH

1	ea	Lockset	Flacon W571-Dane	US26D
3	ea	Hinge	Hager BB1191	US26D
3	ea	Silencers	Ives SR64	Rubber
2	ea	Kick Plates	Rockwood K4125 8"x34"	Clear Plastic

### Hardware Set 110

Single 3'-0" x 6'-8" Solid Wood Door and HM Frame - LH

1	ea	Lockset	Flacon W571-Dane	US26D
3	ea	Hinge	Hager BB1191	US26D
3	ea	Silencers	Ives SR64	Rubber
2	ea	Kick Plates	Rockwood K4125 8"x34"	Clear Plastic

### Hardware Set 111

Single 3'-0" x 7'-0" Aluminum Door and Aluminum Frame - LHR

1	ea	Side Lite	0'-10" Width 1/4 -inch Tempered	Alum Frame
1	ea	Exit Device	Adams Rite 8412C - MEC	US26D
1	ea	Entry Trim	Adams Rite 3080-01	
1	ea	Electric Strike	Adams Rite 7400 Fail Secure	629
1	ea	Cylinder	Adams Rite 4036-01	629
1	ea	Power Supply	Adam Rite PS-SE	-
1	ea	Operator	Stanley Magic Force LE	
1	ea	Activator (exterior)	Stanley Wireless Button and transmitter CL4490 on black square mounting square post CL2247 with CL4163 square button, wireless transmitter CL4490, receiver CL4485, and power supply PS490	
1	ea	Activator (interior)	Stanley Wireless Activator CL4163 plate CL4638 Surface Mount Box	
1	ea	Proxy Reader	Keri NXT5R	-
1	ea	Control Panel	Keri NXT-2D-MS	-
1	ea	Hinge	Select SL-11 HD Continuous	Alum
1	ea	Weather Strip	Pemko HSS2000xS88GR	Silicone
1	ea	Threshold	Pemko 171a Saddle, 1842 APK	Alum
1	ea	Rain Drip	Pemko 346C	Alum

### Hardware Set 112

Existing Single 4'-0" x 6'-8" Steel Door and HM Frame - RHR

No Work

#### Hardware Set 113

Single 3'-0" x 6'-8" Solid Wood Door and HM Frame - RH

1	ea	Push Plate	Rockwood RM1040H	US26D
1	ea	Door Pull	Rockwood RM3010	US32
3	ea	Hinge	Hager BB1191	US26D
3	ea	Silencers	Ives SR64	Rubber
2	ea	Kick Plates	Rockwood K4125 8"x34"	Clear Plastic
1	ea	Closer	LCN 1000	-
1	ea	Threshold	Marble – 4"	-

#### Hardware Set 114

Single 3'-0" x 6'-8" Solid Wood Door and HM Frame - RH

1	ea	Lockset	Flacon W571-Dane	US26D
3	ea	Hinge	Hager BB1191	US26D
3	ea	Silencers	Ives SR64	Rubber
2	ea	Kick Plates	Rockwood K4125 8"x34"	Clear Plastic

#### Hardware Set 115

Single 3'-0" x 6'-8" Solid Wood Door and HM Frame - LH

1	ea	Lockset	Flacon W571-Dane	US26D
3	ea	Hinge	Hager BB1191	US26D
3	ea	Silencers	Ives SR64	Rubber
2	ea	Kick Plates	Rockwood K4125 8"x34"	Clear Plastic

#### Hardware Set 116

Existing Single 3'-0" x 6'-8" Steel Door and HM Frame - RHR

No Work

#### Hardware Set 117

Single 3'-0" x 6'-8" Solid Wood Door and HM Frame - LH

1	ea	Lockset	Flacon W571-Dane	US26D
3	ea	Hinge	Hager BB1191	US26D
3	ea	Silencers	Ives SR64	Rubber

#### Hardware Set 118

Single 3'-0" x 6'-8" Solid Wood Door and HM Frame - RH

1	ea	Lockset	Flacon W571-Dane	US26D
3	ea	Hinge	Hager BB1191	US26D
3	ea	Silencers	Ives SR64	Rubber

**Hardware Set 119**

Single 3'-0" x 6'-8" Steel Door and HM Frame - LHR

1	ea	Lockset	Flacon 301-Dane	US26D
3	ea	Hinge	Hager BB1191	US26D
3	ea	Silencers	Ives SR64	Rubber
1	ea	Threshold	Marble – 4"	-

**Hardware Set 120**

Single 3'-0" x 6'-8" Solid Wood Door and HM Frame - RHR

1	ea	Lockset	Flacon W561-Dane	US26D
3	ea	Hinge	Hager BB1191	US26D
3	ea	Silencers	Ives SR64	Rubber
2	ea	Kick Plates	Rockwood K4125 8"x34"	Clear Plastic

**Hardware Set 121**

Single 3'-0" x 6'-8" Solid Wood Door and HM Frame - RH

1	ea	Push Plate	Rockwood RM1040H	US26D
1	ea	Door Pull	Rockwood RM3010	US32
3	ea	Hinge	Hager BB1191	US26D
3	ea	Silencers	Ives SR64	Rubber
2	ea	Kick Plates	Rockwood K4125 8"x34"	Clear Plastic
1	ea	Closer	LCN 1000	-
1	ea	Threshold	Marble – 4"	-

**Hardware Set 122**

Single 3'-0" x 6'-8" Solid Wood Door and HM Frame - LH

1	ea	Lockset	Flacon W571-Dane	US26D
3	ea	Hinge	Hager BB1191	US26D
3	ea	Silencers	Ives SR64	Rubber
2	ea	Kick Plates	Rockwood K4125 8"x34"	Clear Plastic

**Hardware Set 123**

Existing Single 4'-0" x 6'-8" Steel Door and HM Frame - LHR

No Work



**Hardware Set 200**

Single 3'-0" x 6'-8" Solid Wood Door and HM Frame - LH

1	ea	Lockset	Flacon W571-Dane	US26D
3	ea	Hinge	Hager BB1191	US26D
3	ea	Silencers	Ives SR64	Rubber
2	ea	Kick Plates	Rockwood K4125 8"x34"	Clear Plastic

**Hardware Set 201**

Single 3'-0" x 6'-8" Solid Wood Door and HM Frame - RH

1	ea	Lockset	Flacon W571-Dane	US26D
3	ea	Hinge	Hager BB1191	US26D
3	ea	Silencers	Ives SR64	Rubber
2	ea	Kick Plates	Rockwood K4125 8"x34"	Clear Plastic

**Hardware Set 202**

Single 3'-0" x 6'-8" Solid Wood Door and HM Frame - LH

1	ea	Lockset	Flacon W571-Dane	US26D
3	ea	Hinge	Hager BB1191	US26D
3	ea	Silencers	Ives SR64	Rubber
2	ea	Kick Plates	Rockwood K4125 8"x34"	Clear Plastic

**Hardware Set 203**

Single 3'-0" x 6'-8" Solid Wood Door and HM Frame - RH

1	ea	Lockset	Flacon W571-Dane	US26D
3	ea	Hinge	Hager BB1191	US26D
3	ea	Silencers	Ives SR64	Rubber
2	ea	Kick Plates	Rockwood K4125 8"x34"	Clear Plastic

**Hardware Set 204**

Single 3'-0" x 6'-8" Solid Wood Door and HM Frame - LH

1	ea	Lockset	Flacon W571-Dane	US26D
3	ea	Hinge	Hager BB1191	US26D
3	ea	Silencers	Ives SR64	Rubber
2	ea	Kick Plates	Rockwood K4125 8"x34"	Clear Plastic

**Hardware Set 205**

Single 3'-0" x 6'-8" Solid Wood Door and HM Frame - RH

1	ea	Lockset	Flacon W571-Dane	US26D
3	ea	Hinge	Hager BB1191	US26D
3	ea	Silencers	Ives SR64	Rubber
2	ea	Kick Plates	Rockwood K4125 8"x34"	Clear Plastic

**Hardware Set 206**

Single 3'-0" x 6'-8" Solid Wood Door and HM Frame - RH

1	ea	Lockset	Flacon W561-Dane	US26D
3	ea	Hinge	Hager BB1191	US26D
3	ea	Silencers	Ives SR64	Rubber
2	ea	Kick Plates	Rockwood K4125 8"x34"	Clear Plastic

**Hardware Set 207**

Single 3'-0" x 6'-8" Solid Wood Door and HM Frame - LH

1	ea	Lockset	Flacon W561-Dane	US26D
3	ea	Hinge	Hager BB1191	US26D
3	ea	Silencers	Ives SR64	Rubber
2	ea	Kick Plates	Rockwood K4125 8"x34"	Clear Plastic

**Hardware Set 208**

Single 3'-0" x 6'-8" Solid Wood Door and HM Frame - RH

1	ea	Lockset	Flacon W571-Dane	US26D
3	ea	Hinge	Hager BB1191	US26D
3	ea	Silencers	Ives SR64	Rubber
2	ea	Kick Plates	Rockwood K4125 8"x34"	Clear Plastic

**Hardware Set 209**

Single 3'-0" x 6'-8" Solid Wood Door and HM Frame - LH

1	ea	Lockset	Flacon W571-Dane	US26D
3	ea	Hinge	Hager BB1191	US26D
3	ea	Silencers	Ives SR64	Rubber
2	ea	Kick Plates	Rockwood K4125 8"x34"	Clear Plastic

**Hardware Set 210**

Single 3'-0" x 6'-8" Solid Wood Door and HM Frame - RH

1	ea	Lockset	Flacon W571-Dane	US26D
3	ea	Hinge	Hager BB1191	US26D
3	ea	Silencers	Ives SR64	Rubber
2	ea	Kick Plates	Rockwood K4125 8"x34"	Clear Plastic

**Hardware Set 211**

Single 3'-0" x 6'-8" Solid Wood Door and HM Frame - LH

1	ea	Lockset	Flacon W571-Dane	US26D
3	ea	Hinge	Hager BB1191	US26D
3	ea	Silencers	Ives SR64	Rubber
2	ea	Kick Plates	Rockwood K4125 8"x34"	Clear Plastic

**Hardware Set 212**

Existing Single 4'-0" x 6'-8" Steel Door and HM Frame - RHR

No Work

**Hardware Set 213**

Single 3'-0" x 6'-8" Solid Wood Door and HM Frame - LH

1	ea	Lockset	Flacon W571-Dane	US26D
3	ea	Hinge	Hager BB1191	US26D
3	ea	Silencers	Ives SR64	Rubber
2	ea	Kick Plates	Rockwood K4125 8"x34"	Clear Plastic

**Hardware Set 214**

Single 3'-0" x 6'-8" Solid Wood Door and HM Frame - RH

1	ea	Lockset	Flacon W571-Dane	US26D
3	ea	Hinge	Hager BB1191	US26D
3	ea	Silencers	Ives SR64	Rubber
2	ea	Kick Plates	Rockwood K4125 8"x34"	Clear Plastic

**Hardware Set 215**

Single 3'-0" x 6'-8" Solid Wood Door and HM Frame - LH

1	ea	Push Plate	Rockwood RM1040H	US26D
1	ea	Door Pull	Rockwood RM3010	US32
3	ea	Hinge	Hager BB1191	US26D
3	ea	Silencers	Ives SR64	Rubber
2	ea	Kick Plates	Rockwood K4125 8"x34"	Clear Plastic
1	ea	Closer	LCN 1000	-
1	ea	Threshold	Marble – 4"	-

#### Hardware Set 216

Single 3'-0" x 6'-8" Solid Wood Door and HM Frame - RH

1	ea	Lockset	Flacon W571-Dane	US26D
3	ea	Hinge	Hager BB1191	US26D
3	ea	Silencers	Ives SR64	Rubber
2	ea	Kick Plates	Rockwood K4125 8"x34"	Clear Plastic

#### Hardware Set 217

Single 3'-0" x 6'-8" Solid Wood Door and HM Frame - RH

1	ea	Lockset	Flacon W571-Dane	US26D
3	ea	Hinge	Hager BB1191	US26D
3	ea	Silencers	Ives SR64	Rubber
2	ea	Kick Plates	Rockwood K4125 8"x34"	Clear Plastic

#### Hardware Set 218

Single 3'-0" x 6'-8" Solid Wood Door and HM Frame - RHR

1	ea	Lockset	Flacon W561-Dane	US26D
3	ea	Hinge	Hager BB1191	US26D
3	ea	Silencers	Ives SR64	Rubber
2	ea	Kick Plates	Rockwood K4125 8"x34"	Clear Plastic

#### Hardware Set 219

Single 3'-0" x 6'-8" Solid Wood Door and HM Frame - RH

1	ea	Lockset	Flacon W571-Dane	US26D
3	ea	Hinge	Hager BB1191	US26D
3	ea	Silencers	Ives SR64	Rubber
2	ea	Kick Plates	Rockwood K4125 8"x34"	Clear Plastic

#### Hardware Set 220

Single 3'-0" x 6'-8" Solid Wood Door and HM Frame - RH

1	ea	Lockset	Flacon W571-Dane	US26D
3	ea	Hinge	Hager BB1191	US26D
3	ea	Silencers	Ives SR64	Rubber
2	ea	Kick Plates	Rockwood K4125 8"x34"	Clear Plastic

#### Hardware Set 221

Single 3'-0" x 6'-8" Solid Wood Door and HM Frame - LH

1	ea	Push Plate	Rockwood RM1040H	US26D
1	ea	Door Pull	Rockwood RM3010	US32
3	ea	Hinge	Hager BB1191	US26D
3	ea	Silencers	Ives SR64	Rubber
2	ea	Kick Plates	Rockwood K4125 8"x34"	Clear Plastic
1	ea	Closer	LCN 1000	-
1	ea	Threshold	Marble – 4"	-

#### Hardware Set 222

Single 3'-0" x 6'-8" Solid Wood Door and HM Frame - LH

1	ea	Lockset	Flacon W571-Dane	US26D
3	ea	Hinge	Hager BB1191	US26D
3	ea	Silencers	Ives SR64	Rubber
2	ea	Kick Plates	Rockwood K4125 8"x34"	Clear Plastic

#### Hardware Set 223

Single 3'-0" x 6'-8" Solid Wood Door and HM Frame - RH

1	ea	Lockset	Flacon W571-Dane	US26D
3	ea	Hinge	Hager BB1191	US26D
3	ea	Silencers	Ives SR64	Rubber
2	ea	Kick Plates	Rockwood K4125 8"x34"	Clear Plastic

#### Hardware Set 224

Existing Single 4'-0" x 6'-8" Steel Door and HM Frame - LHR

No Work

Lockset Key:

Panic Bar: Spring loaded, horizontal bar mounted to push side of exit door. No operating entrance device on exterior of door.

Entrance Lockset: Lever handle with keyed entrance from the exterior and push button lock on the interior.

Passage Lockset: Lever handle with no locking mechanism on either side.

Storeroom Lockset: Lever handle with keyed entrance from the exterior and no locking mechanism on the interior. Interior lever always free.

Double Cylinder: Deadbolt cylinder with keyed entrance from both sides, no thumb turn.

Keyed Deadbolt: Deadbolt cylinder with keyed entrance from one exterior and thumb turn on the interior.

END OF HARDWARE SCHEDULE

END OF SECTION

## **SECTION 081113**

### **METAL DOORS AND FRAMES**

#### **PART 1 - GENERAL**

##### **1.1 SECTION INCLUDES**

- A. Filled core steel doors (flush, with glazing and embossed, 6 panel).
- B. Flush hollow metal doors.

##### **1.2 SUBMITTALS**

- A. Shop Drawings: Indicate door and frame elevations, internal reinforcement, cut-outs for glazing, louvers, and finish.
- B. Product Data: Indicate door and frame configurations, location of cut-outs for hardware reinforcement.

##### **1.3 QUALITY ASSURANCE**

- A. Conform to the following:
  - 1. SDI-100 - Standard Steel Doors and Frames.
  - 2. DHI - Door Hardware Institute: The Installation of Commercial Steel Doors and Steel Frames, Insulated Steel Doors in Wood Frames and Builder's Hardware.
  - 3. Handicapped: ANSI A117.1.

##### **1.4 WORK INCLUDED**

- A. Provide all labor, superintendence, materials, tools, transportation, and equipment and all means of construction necessary and reasonably incidental to complete the work as specified herein and as shown on the Contract Drawings.
- B. All materials and labor obviously a part of the work, and as necessary for proper installation and/or operation of same, although not specifically indicated on the Contract Drawings and/or in the Specifications shall be provided by the Contractor as if called in detail without additional cost to the Owner.

#### **PART 2 - PRODUCTS**

##### **2.1 DOORS AND FRAMES**

- A. Door Manufacturers: Subject to compliance with requirements, provide standard steel doors (hollow metal and insulated) and frames by one (1) of the following, or approved equal:
  - 1. Fire Rated - Steelcraft, A14 Series, flush, polystyrene core.
  - 2. Steelcraft, B Series, flush, polystyrene core

- B. Frame Manufacturers: Subject to compliance with requirements, provide standard steel frames (hollow metal) by one (1) of the following, or approved equal:

1. Steelcraft, DW16 and F16 Series, knock-down.

## 2.2 MATERIALS

- A. Standard Steel Doors and Frames:

1. Provide steel doors of types and styles indicated on drawings or schedules.
2. Standards: In addition to other specified requirements, comply with Steel Door Institute "Recommended Specifications for Standard Steel Doors and Frames" (SDI-100), for the following classifications:
  - a. Interior Doors: SDI-100, Grade II, heavy duty, Model 1, minimum 18-gauge faces. Glazing: ¼" clear tempered glass at non-fire rated doors; ¼" clear wire glass at fire rated doors.
  - b. Exterior Door: SDI-100, Grade III, extra heavy-duty, Model 2, minimum 16-gauge faces. Insulated with manufacturer's standard insulated material and provide thermal break. Glazing: Minimum 5/8" thick, clear insulating glass. Reinforce all exterior doors per SDI Bulletin #107.
3. Provide hollow metal frames for doors, transoms, sidelights, borrowed lights, and other openings of types and styles as shown on drawings and schedules. Conceal fastenings, unless otherwise indicated. Fabricate frames of minimum 18-gauge, cold-rolled furniture steel. Provide 16 gauge, welded frames with thermal break at exterior locations. Grout solid when in full brick.
  - a. Form exterior frames of hot dip, galvanized steel.
4. Steel Doors and Frames: Hot-rolled, pickled and oiled per ASTM A569 and A568; cold-rolled per ASTM A366 and A568.
5. Prepare steel doors and frames to receive mortised and concealed finish hardware, including cutouts, reinforcing, drilling and tapping, complying with ANSI A115 "Specifications for Door and Frame Preparation for Hardware".
  - a. Reinforce units to receive surface-applied finish hardware to be field applied.
  - b. Locate finish hardware as indicated or, if not indicated, per DHI "Recommended Locations for Builder's Hardware".
6. Shop paint exposed surfaces of doors and frame units, including galvanized surfaces, using manufacturer's standard, baked-on rust inhibitive primer.



7. Plaster Guards: Provide 26 gauge steel plaster guards or mortar boxes, welded to frame, at back of finish hardware cutouts where mortar or other materials might obstruct hardware operation and to close off interior of openings.

## 2.3 ACCESSORIES

- A. Silencers: Resilient rubber (3 per steel frame).
- B. Removable Stops: Rolled steel channel shape.
- C. Bituminous Coating: Fibered asphalt emulsion.
- D. Primer: Zinc chromate type.
- E. Hardware: Supply finish hardware per Section 08710.

## 2.4 FABRICATION

- A. Fabricate frames, concealed stiffeners, reinforcement, edge channels, louvers and moldings from either cold-rolled or hot-rolled steel (at fabricator's option).
- B. Exposed Fasteners: Unless otherwise indicated, provide countersunk, flat, Phillips head for exposed screws and bolts.
- C. Finish Hardware Preparation: Prepare doors and frames to receive mortised and concealed finish hardware in accordance with final Finish Hardware Schedule and templates provided by hardware supplier. Comply with applicable requirements of ANSI A115 series specifications for door and frame preparation for hardware.
- D. Locate finish hardware as shown on final show drawings or, if not shown, in accordance with "Recommended Locations for Builder's Hardware", published by Door and Hardware Institute.

## 2.5 FINISH

- A. Steel Sheet: Galvanized to ASTM A525 G60 (exterior doors only).
- B. Factory Finish: Primed.
- C. Field Finish: Paint in field.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Install doors and frames in accordance with ANSI/SDI-100.
- B. Coordinate with masonry wall construction for frame anchor placement.

END OF SECTION

**SECTION 081416**  
**FLUSH WOOD DOORS**

**PART 1 - GENERAL**

**1.1 SECTION INCLUDES**

- A. Fire-rated and non-fire rated wood doors.

**1.2 SUBMITTALS**

- A. Shop Drawings: Indicate door elevations, cutouts for glazing.
- B. Samples: Submit two (2) of door veneer.
- C. Colors: Full selection of paint options.

**1.3 QUALITY ASSURANCE**

- A. Perform work in accordance with ANSI/NWWDA I.S.1.

**1.4 WARRANTY**

- A. Provide two (2) year warranty under provisions of Section 017001.

**PART 2 - PRODUCTS**

**2.1 MANUFACTURERS - HOLLOW CORE DOORS WITH HARDBOARD FACES**

- A. Masonite Corp.
- B. Mohawk Door
- C. Simpson Co.
- D. Craft Master or approved equal.

**2.2 INTERIOR WOOD DOORS**

- A. Solid Wood Doors: All interior wood doors shall comply with the following requirements:
  - 1. Faces: Wood Grain Veneer.
  - 2. Grade: Premium.
  - 3. Core Construction: Solid Core.
  - 4. Frames: Pre-hung with frame and pre-machined for hardware.
  - 5. Flush

## 2.3 FABRICATION

- A. Fabricate non-rated doors in accordance with ANSI/NWWDA I.S.1 requirements.
- B. Fabricate doors with hardware reinforcement blocking in place.
- C. Factory machine doors for finish hardware.

## 2.4 FINISH

- A. Prime finish doors and frames in accordance with approved sample.
- B. Stain doors and frames in accordance with 099123 Painting.

# PART 3 - EXECUTION

## 3.1 INSTALLATION

- A. Install doors in accordance with ANSI/NWWDA I.S.1 requirements.
- B. Coordinate installation of doors with installation of frames specified in hardware schedule.

## 3.2 INSTALLATION TOLERANCES

- A. Conform to ANSI/NWWDA requirements for fit and clearance tolerances and maximum diagonal distortion.

END OF SECTION

## SECTION 084114

### ALUMINUM SWING DOORS

#### PART 1 - GENERAL

##### 1.01 SUMMARY

- A. Section Includes: Aluminum Swing Doors, including:
  - 1. YKK AP Series 50M Monumental Swing Entrances.
- B. Related Sections:
  - 1. Glass and Glazing: Refer to Division 8 Glass and Glazing Section for glass and glazing requirements.
  - 2. Single Source Requirement: All products listed below shall be by the same manufacturer.
    - a. Section 084113 Aluminum Storefront.

##### 1.02 SYSTEM PERFORMANCE DESCRIPTION

- A. Performance Requirements: Provide aluminum swing doors that comply with performance requirements indicated, as demonstrated by testing manufacturer's assemblies in accordance with test methods indicated.
  - 1. Air Infiltration (Single Acting Butt Hinges or Offset Pivots): Air infiltration shall be tested in accordance with ASTM E 283 at static pressure of 1.57 PSF (75 Pa). Infiltration shall not exceed 0.50 CFM/FT<sup>2</sup> for single door or 1.00 CFM/FT<sup>2</sup> for pair doors.
  - 2. Structural: Door corner structural strength shall be tested per YKK AP's dual moment test procedure and certified by an independent testing laboratory to ensure corner integrity and weld compliance. Certified test procedures and results are available upon request.
  - 3. Structural Uniform Load Test:
    - a. For 40M: ± 70 psf.
    - b. For 50M: ± 65 psf.
  - 4. Forced Entry Resistance: 300 lbs. satisfactory.

##### 1.03 PROJECT CONDITIONS / SITE CONDITIONS

- A. Field Measurements: Verify actual measurements/openings by field measurements before fabrication; show recorded measurements on shop drawings. Coordinate field measurements, fabrication schedule with construction progress to avoid construction delays.

##### 1.04 SUBMITTALS

- A. General: Prepare, review, approve, and submit specified submittals in accordance with Division 1 Submittals Sections. Product data, shop drawings, samples, and similar submittals are defined in Division 1 Submittals Sections.
- B. Product Data: Submit product data for each entrance series specified.

- C. Substitutions: Whenever substitute products are to be considered, supporting technical data, samples, and test reports must be submitted ten (10) working days prior to bid date in order to make a valid comparison.
- D. Shop Drawings: Submit shop drawings showing layout, profiles, and product components, including anchorage, accessories, and finish colors.
- E. Samples: Submit verification samples for colors. Minimum 2-1/2 inch by 3 inch samples on actual aluminum substrates indicating full color range expected in installed system.
- F. Quality Assurance / Control Submittals:
  - 1. Test Reports: Submit certified test reports showing compliance with specified performance characteristics and physical properties.
  - 2. Installer Qualification Data: Submit installer qualification data.
- G. Closeout Submittals:
  - 1. Warranty: Submit executed warranty documents specified herein, endorsed by YKK AP authorized official and installer.
  - 2. Project Record Documents: Submit project record documents, including operation and maintenance data for installed materials in accordance with Division 1 Project Closeout Section.
    - a. Maintenance Data: Maintenance procedures for care and cleaning of entrance systems.

#### 1.05 QUALITY ASSURANCE

- A. Qualifications:
  - 1. Installer Qualifications: Installer experienced (as determined by contractor) to perform work of this section who has specialized in the installation of work similar to that required for this project. If requested by Owner, submit reference list of completed projects.
  - 2. Manufacturer Qualifications: Manufacturer capable of providing field service representation during construction process.
- B. Pre-Installation Meetings: Conduct pre-installation meeting to verify project requirements, substrate conditions, manufacturer's installation instructions, and manufacturer's warranty requirements.

#### 1.06 WARRANTY

- A. Project Warranty: Refer to "Conditions of the Contract" for project warranty provisions.
- B. Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty document executed by an authorized company official.
  - 1. Warranty Period: Manufacturer's one (1) year standard warranty commencing on the substantial date of completion for the project provided that the warranty, in no event, shall start later than six (6) months from the date of shipment by YKK AP America Inc.

## PART 2 - PRODUCTS

### 2.01 MANUFACTURERS

- A. Acceptable Manufacturers: YKK AP America Inc.  
270 Riverside Parkway, Suite 100  
Austell, GA 30168  
Telephone: (678) 838-6000
  - 1. Monumental Swing Doors: YKK AP Series 40M and 50M Swing Doors.
    - a. 50M Description: 2" thick heavy wall door stile by 5".
  - 2. Corner Construction: Fabricate door corners joined by concealed reinforcement secured with screws, and sigma deep penetration welding.
  - 3. Glazing Stops: Manufacturer's standard snap-in glazing stops with EPDM glazing gaskets to prevent water infiltration.
  - 4. Weather-stripping: Manufacturer's standard pile type in replaceable rabbets for stiles; manufacturer's standard EPDM bulb type for door frames.
  - 5. Hardware: Manufacturer's standard as selected by Architect.
  - 6. 3/16" typical wall thickness for main members of doors (excluding glass stop).

### 2.02 MATERIALS

- A. Extrusions: ASTM B 221 (ASTM B 221M), 6063-T5 Aluminum Alloy.
- B. Aluminum Sheet:
  - 1. Anodized Finish: ASTM B 209 (ASTM B 209M), 5005-H14 Aluminum Alloy, 0.050" minimum thickness.

### 2.03 ACCESSORIES

- A. Manufacturer's Standard Accessories:
  - 1. Fasteners: Zinc plated steel concealed fasteners; Hardened aluminum alloys or AISI 300 series stainless steel exposed fasteners, countersunk, finish to match aluminum color.
  - 2. Sealant: Non-skinning type, AAMA 803.3.
  - 3. Glazing: Setting blocks, edge blocks, and spacers in accordance with ASTM C 864, shore durometer hardness as recommended by manufacturer; Glazing gaskets in accordance with ASTM C 864.

### 2.04 RELATED MATERIALS

- A. Glass: Refer to Division 8 Glass and Glazing Section for glass materials.

### 2.05 FABRICATION

- A. Shop Assembly: Fabricate and assemble units with joints only at intersection of aluminum members with uniform hairline joints; rigidly secure, and sealed in accordance with manufacturer's recommendations.
  - 1. Hardware: Drill and cut to template for hardware. Reinforce frames and door stiles to receive hardware in accordance with manufacturer's recommendations.
  - 2. Welding: Conceal welds on aluminum members in accordance with AWS recommendations or methods recommended by manufacturer. Members

showing welding bloom or discoloration on finish or material distortion will be rejected.

## 2.06 FINISHES AND COLORS

### A. YKK AP America Anodized Plus® Finish, as selected from below:

CODE	DESCRIPTION
YB5N*	Dark Bronze Anodized Plus®
YS1N*	Clear Anodized Plus®
YH3N	Champagne Anodized Plus®
YB1N	Medium Bronze Anodized Plus®
YK1N*	Black Anodized Plus®
YW3N	White Anodized Plus®
M	Mill Finish

\* Indicates standard finish usually carried as inventory.

Anodized Plus® is an advanced sealing technology that completely seals the anodic film yielding superior durability (See AAMA 612).

### B. Anodized Finishing: Prepare aluminum surfaces for specified finish; apply shop finish in accordance with the following:

1. Anodic Coating: Electrolytic color coating followed by an organic seal applied in accordance with the requirements of AAMA 612-02. Aluminum extrusions shall be produced from quality controlled billets meeting AA-6063-T5.
  - a. Exposed Surfaces shall be free of scratches and other serious blemishes.
  - b. Extrusions shall be given a caustic etch followed by an anodic oxide treatment and then sealed with an organic coating applied with an electrodeposition process.
  - c. The anodized coating shall comply with all of the requirements of AAMA 612-02: Voluntary Specifications, Performance Requirements and Test Procedures for Combined Coatings of Anodic Oxide and Transparent Organic Coatings on Architectural Aluminum. Testing shall demonstrate the ability of the finish to resist damage from mortar, salt spray, and chemicals commonly found on construction sites, and to resist the loss of color and gloss.
  - d. Overall coating thickness for finishes shall be a minimum of 0.7 mils.

### C. Finishes Testing:

1. Apply 0.5% solution NaOH, sodium hydroxide, to small area of finished sample area; leave in place for sixty minutes; lightly wipe off NaOH; Do not clean area further.
2. Submit samples with test area noted on each sample.

## PART 3 - EXECUTION

### 3.01 MANUFACTURER'S INSTRUCTIONS / RECOMMENDATIONS

- #### A. Compliance:
- Comply with manufacturer's product data, including product technical bulletins, installation instructions, and product carton instructions. The latest installation instructions are available at [www.ykkap.com](http://www.ykkap.com).

### 3.02 EXAMINATION

- A. Site Verification of Conditions: Verify conditions (which have been previously installed under other sections) are acceptable for product installation in accordance with manufacturer's instructions.
  - 1. Verify location of preset anchors, perimeter fasteners, and block-outs are in accordance with shop drawings.

### 3.03 PREPARATION

- A. Adjacent Surfaces Protection: Protect adjacent work areas and finish surfaces from damage during product installation.
  - 1. Aluminum Surface Protection: Protect aluminum surfaces from contact with lime, mortar, cement, acids, and other harmful contaminants.

### 3.04 INSTALLATION

- A. General: Install manufacturer's system in accordance with shop drawings, and within specified tolerances.
  - 1. Protect aluminum members in contact with masonry, steel, concrete, or dissimilar materials using nylon pads or bituminous coating.
  - 2. Shim and brace aluminum system before anchoring to structure.

### 3.05 FIELD QUALITY CONTROL

- A. Manufacturer's Field Services: Upon request, provide manufacturer's field service consisting of site visit for inspection of product installation in accordance with manufacturer's instructions.

### 3.06 ADJUSTING AND CLEANING

- A. Adjusting: Adjust swing doors for operation in accordance with manufacturer's recommendations.
- B. Cleaning: The General Contractor shall clean installed products in accordance with manufacturer's instructions prior to owner's acceptance, and remove construction debris from project site. Legally dispose of debris.
- C. Protection: The General Contractor shall protect the installed product's finish surfaces from damage during construction.

END OF SECTION



## **SECTION 088100**

### **GLASS GLAZING**

#### **PART 1 GENERAL**

##### **1.1 SECTION INCLUDES**

A. High performance glass of the following types:

1. Low-e insulating glass.

##### **1.2 RELATED SECTIONS**

A. Section 084113 – ALUMINUM FRAMED STOREFRONTS

##### **1.3 REFERENCES**

- A. ANSI Z97.1 - American National Standard for Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test.
- B. ASCE 7 - "Minimum Design Loads for Buildings and Other Structures".
- C. ASTM International (ASTM):
  1. ASTM C 162 - Standard Terminology of Glass and Glass Products.
  2. ASTM C 1036 - Standard Specification for Flat Glass.

##### **1.4 DEFINITIONS**

- A. Manufacturers of Glass Products: Firms that produce primary glass, fabricated glass, or both, as defined in referenced glazing publications.
- B. Glass Thicknesses: Indicated by thickness designations in millimeters according to ASTM C 1036.
- C. Interspace: Space between lites of an insulating-glass unit that contains dehydrated air or other specified gas.
- D. Sealed Insulating Glass Unit Surface Designations:
  1. Surface 1 - Exterior surface of the outer glass lite.
  2. Surface 2 - Interspace surface of the outer glass lite.
  3. Surface 3 - Interspace surface of the inner glass lite.
  4. Surface 4 - Interior surface of the inner glass lite.

##### **1.5 PERFORMANCE REQUIREMENTS**

- A. General: Provide glass capable of withstanding thermal movement and wind and impact loads (where applicable) as specified in paragraph B following.
- B. Glass Design: Glass thickness designations indicated are minimums and are for detailing only. Confirm glass thicknesses by analyzing Project loads and in-service

conditions. Provide glass lites in the thickness designations indicated for various size openings, 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:
  - a. Design Wind Loads: Determine design wind loads applicable to the Project according to ASCE 7, "Minimum Design Loads for Buildings and Other Structures": Section 6.5, "Method 2-Analytical Procedure," based on mean roof heights above grade indicated on Drawings.
    - 1) Ultimate Design Wind Speed, 120 mph.
    - 2) Nominal Design Wind Speed: 92 mph
    - 3) Importance Factor: 1.15.
    - 4) Exposure Category: B.
  - b. Specified Design Snow Loads: As indicated on Drawings, but not less than snow loads applicable to Project as required by ASCE 7, "Minimum Design Loads for Buildings and Other Structures": Section 7.0, "Snow Loads."
- C. Thermal Movements: Provide glazing that allows for thermal movements resulting from ambient and surface temperatures changes acting on glass framing members and glazing components.
- D. Thermal and Optical Performance Properties: Provide glass with performance properties specified based on manufacturer's published test data, as determined according to procedures indicated below:
  1. For monolithic-glass lites, properties are based on units with lites 1/4 inch (6.0 mm) thick.
  2. For insulating-glass units, properties are based on units of thickness indicated for overall unit and for each lite.
  3. Center-of-Glass Values: Based on using LBL-44789 WINDOW 5.0 computer program for the following methodologies:
    - a. U-Factors: NFRC 100 expressed as Btu/ sq. ft. per h per degree F.
    - b. Solar Heat Gain Coefficient: NFRC 200.
    - c. Solar Optical Properties: NFRC 300.

## 1.6 SUBMITTALS

- A. Submit under provisions of Section 013000 – SUBMITTAL PROCEDURES.
- B. Product Data: For each glass product and glazing material indicated.
- C. 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.
- D. Product Certificates: Signed by manufacturers of glass and glazing products certifying that products furnished comply with requirements. For solar-control low-e-coated glass, provide documentation demonstrating that manufacturer of coated glass is certified by coating manufacturer.
- E. Qualification Data: For installers.
- F. Product Test Reports: For each type of glazing.

- G. Warranties: Special warranties specified in this Section.

## 1.7 QUALITY ASSURANCE

- A. Fabricator Qualifications: Vitro Architectural Glass Certified Fabricator Network, as acceptable to the manufacturer.
- B. 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).
- C. Source Limitations for Glass: Obtain the following through one source from a single manufacturer for each glass type: clear float glass, coated float glass and insulating glass.
- D. Glass Product Testing: Obtain glass test results for product test reports in "Submittals" Article from a qualified independent testing agency accredited according to the NFRC CAP 1 Certification Agency Program.
- E. Glazing Publications: Comply with published recommendations of glass product manufacturers and industry organizations, including but not limited to those 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. IGMA Publication for Insulating Glass: SIGMA TM-3000, "Glazing Guidelines for Sealed Insulating Glass Units."
  2. GANA Publications: "Laminated Glazing Reference Manual"; "Glazing Manual."
  3. AAMA: "Sloped Glazing Guidelines."
  4. IGMA: "Guidelines for Sloped Glazing."
- F. 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 testing and inspecting agency:
1. Insulating Glass Certification Council.
  2. Associated Laboratories, Inc.
- G. Safety Glazing Products: Comply with testing requirements in 16 CFR 1201 and, for wired glass, ANSI Z97.1.
1. Subject to compliance with requirements, obtain safety glazing products permanently marked with certification label of the Safety Glazing Certification Council or another certification agency acceptable to authorities having jurisdiction.
  2. Lites more than 9 square feet (sf) (0.84 sq. m) in area are required to be Category II materials.
  3. Where glazing units, including Kind FT glass and laminated glass, are specified in Part 2 articles for glazing lites more than 9 sf in area, provide glazing products that comply with Category II materials, and for lites 9 sf. or less in area, provide glazing products that comply with Category I or II materials.

## 1.8 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.
- B. For insulating-glass units that will be exposed to substantial altitude changes, comply with insulating-glass manufacturer's written recommendations for venting and sealing to avoid hermetic seal ruptures.

## 1.9 WARRANTY

- A. Manufacturer's Warranty for Coated-Glass Products: Manufacturer's standard form, made out to the glass fabricator in which the coated glass manufacturer agrees to replace coated glass units that deteriorates during normal use within the specified warranty period. Deterioration of the coated glass is defined as peeling and/or cracking, or discoloration that is not attributed to glass breakage, seal failure, improper installation, or cleaning and maintenance that is contrary to the manufacturer's written instructions.
  - 1. Warranty Period: 10 years from date of Substantial Completion.
- B. Manufacturer's Warranty on Insulating Glass: Manufacturer's standard form in which the insulating glass unit manufacturer agrees to replace insulating-glass units that deteriorate during normal use within the specified warranty period. Deterioration of insulating glass units is defined as an obstruction of vision by dust, moisture, or a film on the interior surfaces of the glass caused by a failure of the hermetic seal that is not attributed to glass breakage, improper installation, or cleaning and maintenance that is contrary to the manufacturer's written instructions.
  - 1. Warranty Period: 10 years from date of Substantial Completion.

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Vitro Architectural Glass., [www.vitroglazings.com](http://www.vitroglazings.com)
- B. Requests for substitutions will be considered in accordance with provisions of Section 016000 – Material Manufacturer Substitution Policy.

### 2.2 GLASS PRODUCTS

- A. Annealed Float Glass: ASTM C 1036, Type I (transparent flat glass), Quality-Q3; of class indicated.
- B. Tempered Glass: ASTM C 1048, Kind FT (fully tempered), Class 1 (clear); and of quality, finish, and pattern specified.

### 2.3 FABRICATION OF GLAZING UNITS

- A. Fabricate glazing units in sizes required to glaze openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing publications, to comply with system performance requirements.

## 2.4 LOW-E INSULATING GLASS

- A. Type: Low-E Clear Insulating Glass. Clear color, low-reflective glass outdoor appearance.
  - 1. Product: "Solarban " 60 (2) Clear + "Sungate®" 600 (4) Clear by Vitro Architectural Glass
  - 2. Insulating Unit Construction: 1/4 inch (6mm) Clear Glass, "Solarban" 60 Solar Control (Sputtered) on second surface (2) + 1/2 inch (13mm) air space + 1/4 inch (6mm) Clear (transparent) Float Glass "Sungate" 600 (Pyrolitic) Coated on fourth surface (4).
  - 3. Performance Values: Visible Light Transmission - 63 percent; SHGC - 0.36; Shading Coefficient - 0.41; Outdoor Visible Light Reflectance - 12 percent; U-Value Winter - 0.23; U-Value Summer - 0.21.

## 2.5 CLEAR INTERIOR GLASS

- A. Type: Clear float Glass. Clear color, low-reflective glass outdoor appearance.
  - 1. Product: "Starphire " Clear low-iron float glass by Vitro Architectural Glass
  - 2. Performance Values: Visible Light Transmission - 91 percent; Visible Light Reflectance - 8 percent;.

## PART 3 EXECUTION

### 3.1 INSTALLATION

- A. Refer to Section 088101 – GLASS INSTALLATION

END OF SECTION

**SECTION 088000**  
**GLASS INSTALLATION**

**PART 1 - GENERAL**

**1.1 SUMMARY**

**A. Related Documents:**

1. Drawings and general provisions of the Subcontract apply to this Section.
2. Review these documents for coordination with additional requirements and information that apply to work under this Section.

**B. Section Includes:**

1. Glass and glazing required throughout Project and not specified as a part of other Sections.

**C. Related Sections:**

1. Section 088100 GLASS AND GLAZING.

**D. Glass and glazing is specified with the following components. Unless otherwise noted, glass and glazing specified elsewhere shall conform to materials and glazing requirements and procedures specified in this Section.**

**1.2 REFERENCES**

**A. General:**

1. The following documents form part of the Specifications to the extent stated. Where differences exist between codes and standards, the one affording the greatest protection shall apply.
2. Unless otherwise noted, the referenced standard edition is the current one at the time of commencement of the Work.
3. Refer to Division 01 Section "General Requirements" for the list of applicable regulatory requirements.

**B. "Glazing Manual" published by Flat Glass Marketing Assn.**

**C. "Safety Standard for Architectural Glazing Materials (16 CFR 1201) CI and CII issued by the Consumer Product Safety Commission.**

**D. ANSI Z 97.1, "Safety Glass Test Requirements".**

- E. ASTM International.
  - 1. ASTM C864 Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers.
  - 2. ASTM C1036 Standard Specification for Flat Glass.
  - 3. ASTM E774 Standard Specification for the Classification of the Durability of Sealed Insulating Glass Units. (This standard is withdrawn and no replacement has been issued).
- F. DD-G-1403.
- G. Sealed Insulating Glass Manufacturers Association (SIGMA) Recommendations.
- H. BAAQMD Regulation 8-51 - Adhesive and Sealant Products.

### 1.3 SYSTEM DESCRIPTION

- A. Install each piece of glass watertight and airtight. Each installation shall withstand local, normal temperature changes, wind loading, impact loading (for operating sash and doors) without failure of any kind, including loss or breakage of glass, failure of sealants or gaskets to remain watertight, deterioration of glazing materials, and other defects of work.
- B. Where no thickness of glass is given in the glass schedule, it shall be determined by glass manufacturer for the wind loads specified.

### 1.4 SUBMITTALS

- A. Submit under provisions of Section 013000 Submittal Procedures.
- B. Product Data: Manufacturer's product data, material safety data sheets, and specifications for installations indicated, listing specific materials proposed. Indicate completely, recommendations for use of primers, joint preparation and sealant dimensions, and shall state shelf life (from date of shipment by manufacturer to expiration date for use on a project) for the material. Provide necessary information required to translate batch number code into date of manufacture and to thereby determine the latest date of usage from manufacturer's shelf life requirements.
- C. Certifications:
  - 1. Certification that all insulating units furnished comply with Class CBA of ASTM E774 and the performance specified.
  - 2. Certification that all sealants are fully compatible with the surfaces and finishes with which they are in contact.
- D. Closeout Submittals: Material Safety Data: Sealant and adhesive quantity use for in accordance with requirements of BAAQMD Regulation 8-51.
  - 1. Inside of the weatherproofing system, including printed statement of VOC content.

## 1.5 QUALITY ASSURANCE

- A. Regulatory Requirements: Glazing materials and installation shall comply with the requirements of Bay Area Air Quality Management District Regulation 8-51.

## 1.6 DELIVERY, STORAGE AND HANDLING

- A. Package and deliver glass in manufacturer's sealed unopened containers, fully identified, and each pane clearly labeled with manufacturer's name and product designation.
- B. Protect glass from damage and store in accordance with manufacturer's recommendations. Keep handling to a minimum. Protect edges of laminated and insulated glass from damage.
- C. Glazing Sealants:
  - 1. Deliver sealants and related accessories to the job site in factory sealed, unopened containers bearing manufacturer's name, product designation and batch number.
  - 2. Store in unopened containers. Follow manufacturer's recommendations for storage temperatures and shelf life (see "Submittals" above).
  - 3. Follow manufacturer's recommendations for handling products containing toxic materials. Keep flammable material away from heat, sparks and open flame. Use recommended solvents and cleaning agents for cleaning tools, equipment and skin.

## 1.7 ENVIRONMENTAL CONDITIONS

- A. Perform no glazing operations when ambient temperature is at or below 40 deg F (4.4 deg C).

## 1.8 WARRANTIES

- A. Insulating Glass Units: Warrant for 10 years from date of acceptance of Project to be free from delamination and failure of seals and not to develop material obstruction of vision as a result of dust, moisture or film formation on internal glass surfaces.
- B. Low-E Glass: Warrant for 10 years from date of acceptance of Project to be free of peeling or other deterioration of the Low-E coating.
- C. Glazing Sealants: Warrant for 10 years per sealant manufacturer's standard warranty of merchantable quality. Warranty shall certify that cured sealants:
  - 1. Will perform as a watertight weatherseal.
  - 2. Will not become brittle or crack due to weathering or normal expansion and contraction of adjacent surfaces.



3. Will not harden beyond a Shore A durometer of 50, nor soften below a durometer of 10.
4. Will not change color when used with compatible back-up materials.
5. Will not bleed.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Glass Manufacturers: PPG, LOF, Guardian Industries, Ford Glass, Hordis Brothers Inc., or equivalent. Provide all tinted and Low-E glass from the same manufacturer for the entire project.

### 2.2 MATERIALS

- A. Glass types, as indicated in Section 088100. Where no thickness is given, it shall be determined by glass manufacturer as specified in Article 1.04 System Description of this Section. Adjacent tinted and Low-E glass shall have the same light transmittance.
  1. Glazing Materials and Accessories: Glazing materials and accessories shall be fully compatible with the materials and finishes with which they are in contact. Neoprene and EPDM materials shall not come in contact with silicone sealant materials. Silicone rubber spacers, setting and edge blocks and gaskets shall be either Type I (designed to prevent adhesion) or Type II (designed for adhesion) as per glazing system manufacturer's recommendations for each condition of use.
    - a. Glazing Tapes: Preformed, preshimmed polyisobutylene-butyl tape, 1/2 inch (13 mm) wide x thickness to suit proper face clearance of glass, black color; "Pecora BB-50 Extrude-Seal", PTI "606", Tremco Preshimmed #440, or "Polyshim" ("Polyshim" only where glass lites exceed 150 united inches), or equal.
    - b. Glazing Sealants: One component, silicone based sealant, black color; Dow-Corning "795" or General Electric "Silpruf 2000", or equal. Sealants shall be recommended by the manufacturer for the particular condition of use.
    - c. Glazing Sealants (Butt Glazing And Steel Windows): One component, silicone based sealant, black color except clear color at butt glazing; Dow-Corning "795" or "999-A", or General Electric "Gesil N 2600", "SCS 100" or "SCS 1200", or equal, as per manufacturer's recommendations for the particular condition of use.
    - d. Primers (If Required For Sealants): Non-staining and non-etching type as recommended by sealant manufacturer.
    - e. Setting Blocks: Neoprene, EPDM or silicone rubber conforming to ASTM C 864, 80-90 Shore A durometer hardness, and which will permit permanent mounting. Blocks shall be 0.1 inch (2.5 mm) long for each square foot of glass area (but no less than 4 inches (100 mm)) x 1/16 inches (1.6 mm) less than full channel width and of thickness to provide proper bite and minimum edge clearance for glass. Where length of block may become excessive, lead blocks

having a length of 0.05" for each square foot of glass (4 inches (100 mm) minimum) may be used. Do not use lead blocks for insulating, laminated or wire glass.

- f. Edge Blocks: Neoprene, EPDM or silicone rubber conforming to ASTM C 864, 60-70 Shore A durometer hardness, and which will permit permanent mounting. Blocks shall be 3 inches (75 mm) minimum length x full channel width and of thickness or configuration to provide 1/8 inch (3 mm) (nom.) clearance between block and glass edge.
- g. Glazing Spacers: Neoprene, EPDM or silicone rubber conforming to ASTM C 864, 60-70 Shore A durometer hardness, size as required by glazing conditions, continuous (do not use intermittent spacers).
- h. Insulation (Glass Spandrels): Owens-Corning Fiberglas "CW 225-FSK", or approved equal, fiberglass, semi-rigid, friction fit board with integral aluminum foil vapor barrier, "R" value as indicated on Drawings. Include galvanized steel mounting channels as required by job conditions.

## 2.3 FABRICATION

- A. Cut glass to full fit and play, consistent with glass and glazing material manufacturers' recommendations and the requirements of the Drawings and References, Codes and Standards Article.
- B. Follow code requirements and glass manufacturer's recommendations for minimum bite and edge and face clearances.
- C. Cut lights to smooth straight edges, clean, free of nicks and flares; nipping not permitted. Follow glass manufacturer's directions exactly for tinted and Low-E glass.
- D. Where glass edges (including cut openings) are required to be exposed, grind smooth and polish.
- E. Tempered and heat strengthened glass shall be horizontally treated only. Fabrication and treatment shall, where at all possible, be such that roller distortion lines (where they may occur) will run horizontally (parallel to sill and head) after installation.
- F. Glass Identification:
  - 1. Tempered and heat strengthened glass shall bear the manufacturer's identification as to type and thickness.
  - 2. Glazing in fire rated doors and fire rated windows shall bear UL classification marking in accordance with UL 9.
  - 3. Manufacturer's and UL identifications for glazing shall be permanently etched so as to be visible after glass has been set in place and glazed.
  - 4. Glass other than tempered, heat strengthened and UL-marked glass shall not have labels.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Inspect surfaces to receive glazing materials and report defects which might adversely affect the glazing work. Commencing work implies acceptance of surfaces as satisfactory.
- B. Weep systems shall be open.
- C. Surfaces shall be free of condensation and moisture.
- D. Steel surfaces shall be primed and dry.

### 3.2 PREPARATION

- A. Clean rebates and glazing reveals free of foreign matter, special coatings, dust, grease, projections and irregularities prior to setting glass. Solvents used for cleaning shall not etch or damage glass or metal surfaces.
- B. Wipe glass free of dust and oil.

### 3.3 INSTALLATION

- A. Conform to recommendations of glass manufacturer where such covers points not shown on Drawings or specified herein.
- B. Remove "loose" stops furnished with the units and reinstall as a part of the glazing operation.
- C. Handle lites so as to prevent nicks and flares on glass edges.
- D. Install glass exceeding 1/8" thickness on identical setting blocks permanently mounted and centered at 1/4 points. If necessary to reduce deflection of horizontal supporting member, blocks may be placed at 1/8 points or with the nearest end 6" (whichever is greater) from edge of glass unit. Ensure that blocks are equidistant from centerline of glass. Do not obstruct weep holes.
- E. Provide permanently mounted edge blocks at head and jambs of dry-glazed lights to prevent damage to glass edges during installation and lateral shifting of glass due to thermal and seismic loads and vibrations. Follow recommendations of Flat Glass Marketing Assn. Glazing Manual.
- F. Set glass to maintain bite, edge and face clearance stipulated by code and the glass manufacturer.
- G. Take special precautions to protect laminated glass edges from deterioration of vinyl interlayer by moisture.
- H. Glaze dry-glazed aluminum doors and frames as per manufacturer's directions using glazing gaskets and seals furnished with the units.

- I. Miter gaskets at corners, and install so as to prevent pulling away at corners. Gaskets with gaps or other visible irregularities on door and window units shall be corrected by manufacturer or fabricator at no additional cost to University.
- J. Set interior non-wired glass in fixed stops with glazing tape one face.
- K. Wire glass installed in metal frames and stops shall be embedded in metal sash putty, and all exposed joints between the metal and the glass struck and pointed.
- L. Close and tightly seal all partly used sealant containers, and store protected in well-ventilated area at temperature recommended by sealant manufacturer.

### 3.4 FIELD QUALITY CONTROL

- A. Conduct field check (test) of glazing in exterior for water leakage in accordance with AAMA 501.2.
- B. After substantial cure of exterior glazing sealants which are exposed to the weather, test for water leaks. Flood the joint exposure with water directed from a 3/4 inch (38 mm) garden hose held perpendicular to the wall face, 24 inches (600 mm) from the joint, connected to a water system with 43 psf minimum static water pressure. Move stream of water along joint at an approximate rate of 20 feet (6 m) per minute.
- C. Test approximately 5 percent of total glazing system in locations which are typical of every joint condition and which can be inspected easily for leakage on opposite face. Conduct tests in presence of the Project Manager, who will determine actual percentage of joints to be tested and the actual period of exposure to water from hose, based upon extent of observed leakage or lack thereof.
- D. Repair glazing installation at leaks or, where leakage is excessive, replace glazing sealants.
- E. Where nature of observed leakage indicates possibility of inadequate glazing joint bond strength, the Project Manager may direct that additional testing be performed at a time when joints have been fully cured, followed by natural exposure through both extreme temperatures, and returned to range of temperature in which it is feasible to conduct testing. Repair or replace work as required for permanent elimination of leakage.

### 3.5 WASTE MANAGEMENT

- A. Separate float glass and place in designated containers for recycling.
- B. Separate tempered glass and place in designated containers for recycling.
- C. Place used sealant containers in designated containers for legal disposal.

### 3.6 CLEANING

- A. Initial cleaning of glass surfaces is a part of this Section. Follow glass manufacturer's directions exactly for cleaning tinted and Low-E glass. Do not use abrasive cleaners or sharp instruments. Final cleaning and periodic cleaning of glass for protection from etching due to alkaline runoff from cementitious surfaces or due to construction soil is a part of the General Subcontract and is specified as a part of Division 01.

### 3.7 PROTECTION

- A. Protect installed glass from damage due to subsequent construction operations.
- B. Identification or caution markers shall not be applied to glass surfaces nor shall they be applied to metal surfaces in any way which would damage or stain the metal.
- C. Replace glass broken or damaged prior to acceptance of Project. Costs occasioned by replacement shall be borne by those causing the damage.

END OF SECTION

**SECTION 092900**  
**GYPSUM BOARD SYSTEMS**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. Section Includes:
  - 1. Interior gypsum board for ceilings and walls.

**1.3 ACTION SUBMITTALS**

- A. Product Data: For each type of product.

**1.4 DELIVERY, STORAGE AND HANDLING**

- A. Store materials inside under cover and keep them dry and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage. Stack panels flat and supported on risers on a flat platform to prevent sagging.

**1.5 FIELD CONDITIONS**

- A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written recommendations, whichever are more stringent.
- B. Do not install paper-faced gypsum panels until installation areas are enclosed and conditioned.
- C. Do not install panels that are wet, those that are moisture damaged, and those that are mold damaged.
  - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
  - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

## PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

- A. Moisture- and Mold-Resistant Assemblies: Provide and install moisture- and mold-resistant glass-mat gypsum wallboard products with moisture-resistant surfaces complying with ASTM C 1658 and ASTM C 1177 where indicated on Drawings and in all locations which might be subject to moisture exposure during construction.
- B. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency.
- C. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.
- D. Low-Emitting Materials: For ceiling and wall assemblies, provide materials and construction identical to those tested in assembly and complying 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."

### 2.2 GYPSUM BOARD, GENERAL

- A. Size: Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

### 2.3 INTERIOR GYPSUM BOARD

- A. Basis-of-Design Product: The design for each type of gypsum board and related products is based on Georgia-Pacific Gypsum products named. Subject to compliance with requirements, provide the named product or a comparable product by one of the following:
  - 1. American Gypsum.
  - 2. CertainTeed Corp.
  - 3. Lafarge North America Inc.
  - 4. National Gypsum Company.
  - 5. PABCO Gypsum.
  - 6. Temple-Inland.
  - 7. USG Corporation.

- B. Gypsum Wallboard: ASTM C 1396/C 1396M.
  - 1. Basis-of-Design Product: Georgia-Pacific Gypsum; DensArmor Plus High-Performance Interior Panel.
  - 2. Thickness: 5/8 inch (15.9 mm).
  - 3. Long Edges: Tapered.
- C. Gypsum Board, Type X: ASTM C 1396/C 1396M.
  - 1. Basis-of-Design Product: Georgia-Pacific Gypsum; ToughRock Fireguard Gypsum Board.
  - 2. Thickness: 5/8 inch (15.9 mm).
  - 3. Long Edges: Tapered.
- D. Moisture- and Mold-Resistant Gypsum Board: ASTM C 1396/C 1396M. With moisture- and mold-resistant core and paper surfaces.
  - 1. Basis-of-Design Product: Georgia-Pacific-P Gypsum; ToughRock Mold-Guard Gypsum Panel.
  - 2. Core: As indicated, regular type.
  - 3. Long Edges: Tapered.
  - 4. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.

## 2.4 EXTERIOR GYPSUM BOARD FOR CEILINGS AND SOFFITS

- A. Exterior Gypsum Soffit Board: ASTM C 1396/C 1396M, with manufacturer's standard edges.
  - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Georgia-Pacific Gypsum; "ToughRock Soffit Board" or a comparable product by one of the following:
    - a. American Gypsum.
    - b. CertainTeed Corp.
    - c. Lafarge North America Inc.
    - d. National Gypsum Company.
    - e. PABCO Gypsum.
    - f. Temple-Inland.
    - g. USG Corporation.
  - 2. Core: As indicated.
- B. Glass-Mat Gypsum Sheathing Board: ASTM C 1177/C 1177M, with fiberglass mat laminated to both sides and with manufacturer's standard edges.
  - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Georgia-Pacific Gypsum; "DensGlass Sheathing" or a comparable product by one of the following:



- a. CertainTeed Corp.
  - b. National Gypsum Company.
  - c. USG Corporation.
2. Core: As indicated, regular type.

## 2.5 TRIM ACCESSORIES

### A. Interior Trim: ASTM C 1047.

- 1. Material: Plastic.
- 2. Shapes:
  - a. Cornerbead.
  - b. Bullnose bead.
  - c. LC-Bead: J-shaped; exposed long flange receives joint compound.
  - d. L-Bead: L-shaped; exposed long flange receives joint compound.
  - e. U-Bead: J-shaped; exposed short flange does not receive joint compound.
  - f. Expansion (control) joint.
  - g. Curved-Edge Cornerbead: With notched or flexible flanges.

### B. Exterior Trim: ASTM C 1047.

- 1. Material: rolled zinc.
- 2. Shapes:
  - a. Cornerbead.
  - b. LC-Bead: J-shaped; exposed long flange receives joint compound.
  - c. Expansion (Control) Joint: One-piece, rolled zinc with V-shaped slot and removable strip covering slot opening.

### C. Aluminum Trim: Extruded accessories of profiles and dimensions indicated.

- 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. Fry Reglet Corp.
  - b. Gordon, Inc.
  - c. Pittcon Industries.
- 2. Aluminum: Alloy and temper with not less than the strength and durability properties of **ASTM B 221 (ASTM B 221M)**, Alloy 6063-T5.
- 3. Finish: Corrosion-resistant primer compatible with joint compound and finish materials specified.

## 2.6 JOINT TREATMENT MATERIALS

- A. General: Comply with ASTM C 475/C 475M.
- B. Joint Tape:
  - 1. Interior Gypsum Board: Paper.
  - 2. Exterior Gypsum Soffit Board: Paper.
  - 3. Exterior Glass Mat Gypsum Soffit: Fiberglass mesh.
  - 4. Glass-Mat Gypsum Wallboard: 10-by-10 fiberglass mesh.
  - 5. Glass-Mat Gypsum Sheathing Board: 10-by-10 fiberglass mesh.
  - 6. Tile Backing Panels: As recommended by panel manufacturer.
- C. Joint Compound for Interior Gypsum Board: 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.
    - a. Basis-of-Design Product: Georgia-Pacific Gypsum; ToughRock Setting Compound.
  - 2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use setting-type taping compound.
    - a. Basis-of-Design Product: Georgia-Pacific Gypsum; ToughRock Ready Mix All-Purpose Joint Compound.
    - b. Use setting-type compound for installing paper-faced metal trim accessories.
  - 3. Fill Coat: For second coat, use setting-type, sandable topping compound.
    - a. Basis-of-Design Product: Georgia-Pacific Gypsum; ToughRock Ready Mix All-Purpose Joint Compound.
  - 4. Finish Coat: For third coat, use setting-type, sandable topping compound.
    - a. Basis-of-Design Product: Georgia-Pacific Gypsum; ToughRock Ready Mix Topping Joint Compound.
  - 5. Skim Coat: For final coat of Level 5 finish, use setting-type, sandable topping compound.
    - a. Basis-of-Design Product: Georgia-Pacific Gypsum; ToughRock Sandable Setting Compound
- D. Joint Compound for Exterior Soffit Applications:
  - 1. Basis-of-Design Product: Georgia-Pacific Gypsum; "ToughRock Setting Compound."
  - 2. Exterior Gypsum Soffit Board: Use setting-type taping compound and setting-type, sandable topping compound.

3. Glass-Mat Gypsum Sheathing Board: As recommended by sheathing board manufacturer.

E. Joint Compound for Tile Backing Panels:

1. Glass-Mat, Water-Resistant Backing Panel: As recommended by backing panel manufacturer.
2. Cementitious Backer Units: As recommended by backer unit manufacturer.

## 2.7 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written recommendations.

B. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.

1. Use screws complying with ASTM C 954 for fastening panels to steel members from **0.033 to 0.112 inch (0.84 to 2.84 mm)** thick.
2. For fastening cementitious backer units, use screws of type and size recommended by panel manufacturer.

C. Sound Attenuation Blankets: ASTM C 665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool.

1. Fire-Resistance-Rated Assemblies: Comply with mineral-fiber requirements of assembly.
2. Recycled Content of Blankets: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 50 percent.

D. Acoustical Joint Sealant: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
  - a. Accumetric LLC; BOSS 824 Acoustical Sound Sealant.
  - b. Grabber Construction Products; Acoustical Sealant GSC.
  - c. Pecora Corporation; AIS-919.
  - d. Specified Technologies, Inc.; Smoke N Sound Acoustical Sealant.
  - e. USG Corporation; SHEETROCK Acoustical Sealant.
2. Acoustical joint sealant shall have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
3. Acoustical joint sealant 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."

- E. Thermal Insulation: As specified in Section 072100 "Thermal Insulation."
- F. Vapor Retarder: As specified in Section 072100 "Thermal Insulation."

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine areas and substrates including welded hollow-metal frames and framing, with Installer present, for compliance with requirements and other conditions affecting performance.
- B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 APPLYING AND FINISHING PANELS, GENERAL

- A. Comply with ASTM C 840.
- B. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.
- C. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than **1/16 inch (1.5 mm)** of open space between panels. Do not force into place.
- D. 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.
- E. Form control and expansion joints with space between edges of adjoining gypsum panels.
- F. Cover both faces of support 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. (0.7 sq. m)** in area.
  - 2. Fit gypsum panels around ducts, pipes, and conduits.

3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow ~~1/4- to 3/8-inch-~~ (6.4- to 9.5-mm-) wide joints to install sealant.
- G. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments, except floors. Provide ~~1/4- to 1/2-inch-~~ (6.4- to 12.7-mm-) wide spaces at these locations and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.
- H. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.
- I. Wood Framing: Install gypsum panels over wood framing, with floating internal corner construction. Do not attach gypsum panels across the flat grain of wide-dimension lumber, including floor joists and headers. Float gypsum panels over these members or provide control joints to counteract wood shrinkage.
- J. STC-Rated Assemblies: Seal construction at perimeters, behind control 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 with manufacturer's written recommendations for locating edge trim and closing off sound-flanking paths around or through assemblies, including sealing partitions above acoustical ceilings.
- K. Install sound attenuation blankets before installing gypsum panels unless blankets are readily installed after panels have been installed on one side.

### 3.3 APPLYING INTERIOR GYPSUM BOARD

- A. Install interior gypsum board in the following locations:
  1. Wallboard Type: As indicated on Drawings.
  2. Type X: As indicated on Drawings and where required for fire-resistance-rated assembly.
  3. Flexible Type: As indicated on Drawings. Apply in double layer at curved assemblies.
  4. Ceiling Type: As indicated on Drawings.
  5. Foil-Backed Type: As indicated on Drawings.
  6. Abuse-Resistant Type: As indicated on Drawings.
  7. Impact-Resistant Type: As indicated on Drawings.
  8. Moisture- and Mold-Resistant Type: As indicated on Drawings.
  9. Type C: As indicated on Drawings. Where required for specific fire-resistance-rated assembly indicated.
  10. Glass-Mat Interior Type: As indicated on Drawings.
  11. Acoustically Enhanced Type: [As indicated on Drawings.
  12. Skim-Coated Type: [As indicated on Drawings.
- B. Single-Layer Application:

1. On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing unless otherwise indicated.
2. On partitions/walls, apply gypsum panels horizontally (perpendicular 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 panels.
  - b. At stairwells and other high walls, install panels horizontally unless otherwise indicated or required by fire-resistance-rated assembly.
3. On Z-furring members, apply gypsum panels vertically (parallel to framing) with no end joints. Locate edge joints over furring members.
4. Fastening Methods: Apply gypsum panels to supports with steel drill screws.

C. Multilayer Application:

1. 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 one framing member, **16 inches (400 mm)** minimum, from parallel base-layer joints, unless otherwise indicated or required by fire-resistance-rated assembly.
2. 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.
3. On Z-furring members, apply base layer vertically (parallel to framing) and face layer either vertically (parallel to framing) or horizontally (perpendicular to framing) with vertical joints offset at least one furring member. Locate edge joints of base layer over furring members.
4. Fastening Methods: Fasten base layers and face layers separately to supports with screws.

- D. 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.

E. Curved Surfaces:

1. Install panels horizontally (perpendicular to supports) and unbroken, to extent possible, across curved surface plus **12-inch- (300-mm-)** long straight sections at ends of curves and tangent to them.
2. For double-layer construction, fasten base layer to studs with screws **16 inches (400 mm)** o.c. Center gypsum board face layer over joints in base layer, and fasten to studs with screws spaced **12 inches (300 mm)** o.c.

### 3.4 APPLYING EXTERIOR GYPSUM PANELS FOR CEILINGS AND SOFFITS

- A. Apply panels perpendicular to supports, with end joints staggered and located over supports.
  - 1. Install with **1/4-inch (6.4-mm)** open space where panels abut other construction or structural penetrations.
  - 2. Fasten with corrosion-resistant screws.

### 3.5 APPLYING TILE BACKING PANELS

- A. Glass-Mat, Water-Resistant Backing Panels: Comply with manufacturer's written installation instructions and install at [showers, tubs, and where indicated] [locations indicated to receive tile]. Install with **1/4-inch (6.4-mm)** gap where panels abut other construction or penetrations.
- B. Cementitious Backer Units: ANSI A108.11, at showers, tubs, and where indicated] [locations indicated to receive tile.
- C. Where tile backing panels abut other types of panels in same plane, shim surfaces to produce a uniform plane across panel surfaces.

### 3.6 INSTALLING TRIM ACCESSORIES

- A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.
- B. Control Joints: Install control joints at locations indicated on Drawings, according to ASTM C 840, and in specific locations approved by Architect for visual effect.
- C. Interior Trim: Install in the following locations:
  - 1. Cornerbead: Use at outside corners[ unless otherwise indicated].
  - 2. LC-Bead: Use at exposed panel edges.
  - 3. L-Bead: Use where indicated.
  - 4. U-Bead: Use [at exposed panel edges where indicated.
  - 5. Curved-Edge Cornerbead: Use at curved openings.
- D. Exterior Trim: Install in the following locations:
  - 1. Cornerbead: Use at outside corners.
  - 2. LC-Bead: Use [at exposed panel edges.
- E. Aluminum Trim: Install in locations indicated on Drawings.

### 3.7 FINISHING GYPSUM BOARD

- 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 for trim products specifically indicated as not intended to receive tape.
- D. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:
  - 1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.
  - 2. Level 2: Panels that are substrate for tile.
  - 3. Level 3: Where indicated on Drawings.
  - 4. Level 4: At panel surfaces that will be exposed to view unless otherwise indicated.
    - a. Primer and its application to surfaces are specified in Section 099123 "Interior Painting."
  - 5. Level 5: Where indicated on Drawings.
    - a. Primer and its application to surfaces are specified in Section 099123 "Interior Painting."
- E. Glass-Mat Gypsum Sheathing Panel: Finish according to manufacturer's written instructions for use as exposed soffit board.
- F. Glass-Mat Faced Panels: Finish according to manufacturer's written instructions.
- G. Cementitious Backer Units: Finish according to manufacturer's written instructions.

### 3.8 APPLYING TEXTURE FINISHES

- A. Surface Preparation and Primer: Prepare and apply primer to gypsum panels and other surfaces receiving texture finishes. Apply primer to surfaces that are clean, dry, and smooth.
- B. Texture Finish Application: Mix and apply finish using powered spray equipment, to produce a uniform texture free of starved spots or other evidence of thin application or of application patterns.
- C. Prevent texture finishes from coming into contact with surfaces not indicated to receive texture finish by covering them with masking agents, polyethylene film, or other means. If, despite these precautions, texture finishes contact these surfaces, immediately remove droppings and overspray to prevent damage according to texture-finish manufacturer's written recommendations.



### 3.9 PROTECTION

- A. Protect adjacent surfaces from drywall compound and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.
- B. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.
- C. Remove and replace panels that are wet, moisture damaged, and mold damaged.
  - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
  - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION

## **SECTION 093000 PORCELAIN TILE**

### **1 GENERAL**

#### **1.1 SECTION INCLUDES**

##### **1.1.1 Tile and Accessories:**

- 1.1.1.1 ColorBody Porcelain.
- 1.1.1.2 Glazed Porcelain.
- 1.1.1.3 Trim and Accessories.
- 1.1.1.4 Setting Materials.

#### **1.2 RELATED SECTIONS**

- 1.2.1 Section 07 91 26 - Joint Fillers.

#### **1.3 REFERENCES**

##### **1.3.1 American National Standards Institute (ANSI):**

- 1.3.1.1 ANSI A108.1A - Specifications for Installation of Ceramic Tile in the Wet-Set Method with Portland Cement Mortar.
- 1.3.1.2 ANSI A108.1B - Specifications for Installation of Ceramic Tile on a Cured Portland Cement Mortar Setting Bed with Dry-Set or Latex Portland Cement Mortar.
- 1.3.1.3 ANSI A108.1C - Specifications for Contractors Option: Installation of Ceramic Tile in the Wet-Set Method with Portland Cement Mortar -or- Installation of Ceramic Tile on a Cured Portland Cement Mortar Setting Bed with Dry-Set or Latex Portland Cement Mortar.
- 1.3.1.4 ANSI A108.4 - Specifications for Ceramic Tile Installed with Organic Adhesives or Water-Cleanable Tile Setting Epoxy Adhesive.
- 1.3.1.5 ANSI A108.5 - Specifications for Ceramic Tile Installed with Dry-Set Portland Cement Mortar or Latex-Portland Cement Mortar.
- 1.3.1.6 ANSI A108.6 - Specifications for Ceramic Tile Installed with Chemical-Resistant, Water-Cleanable Tile-Setting and -Grouting Epoxy.
- 1.3.1.7 ANSI A108.8 - Specifications for Ceramic Tile Installed with Chemical-Resistant Furan Mortar and Grout.
- 1.3.1.8 ANSI A108.9 - Specifications for Ceramic Tile Installed with Modified Epoxy Emulsion Mortar/Grout.
- 1.3.1.9 ANSI A108.10 - Specifications for Installation of Grout in Tilework.
- 1.3.1.10 ANSI A118.1 - Standard Specification for Dry-Set Portland Cement Mortar.
- 1.3.1.11 ANSI A118.3 - Chemical-Resistant, Water-Cleanable, Tile-Setting and -Grouting Epoxy and Water-Cleanable Tile-Setting Epoxy Adhesive.
- 1.3.1.12 ANSI A118.4 - Latex-Portland Cement Mortar.
- 1.3.1.13 ANSI A118.5 - Chemical-Resistant Furan Mortar and Grout.
- 1.3.1.14 ANSI A118.6 - Standard Ceramic Tile Grouts.
- 1.3.1.15 ANSI A118.7 - Polymer Modified Cement Grouts
- 1.3.1.16 ANSI A118.8 - Modified Epoxy Emulsion Mortar/Grout.
- 1.3.1.17 ANSI A118.9 - Test Methods and Specifications for Cementitious Backer Units
- 1.3.1.18 ANSI A118.10 - Load bearing, Bonded, Waterproof Membranes for Thinset Ceramic Tile and Dimensional Stone.
- 1.3.1.19 ANSI A118.11 - Exterior Grade Plywood (EGP) Latex-Portland Cement Mortar.
- 1.3.1.20 ANSI A136.1 - Organic Adhesives for Installation of Ceramic Tile.
- 1.3.1.21 ANSI A137.1 - Specifications for Ceramic Tile.

##### **1.3.2 ASTM International (ASTM):**

- 1.3.2.1 ASTM C 50 - Standard Practice for Sampling, Sample Preparation, Packaging, and Marking of Lime and Limestone Products.
- 1.3.2.2 ASTM C 144 - Standard Specification for Aggregate for Masonry Mortar.
- 1.3.2.3 ASTM C 207 - Standard Specification for Hydrated Lime for Masonry Purposes.
- 1.3.2.4 ASTM C 241 - Standard Test Method For Abrasion Resistance of Stone Subjected to Foot Traffic.
- 1.3.2.5 ASTM C 1028 - Standard Test method for Determining the Static Coefficient of Friction or Ceramic Tile and Other Like Surfaces by the Horizontal Dynamometer Pull meter Method.

1.3.3 Tile Council of North America (TCNA): TCA Handbook for Ceramic Tile Installation, 2007.

#### 1.4 PERFORMANCE REQUIREMENTS

- 1.4.1 Static Coefficient of Friction: Tile on walkway surfaces shall be provided with the following values as determined by testing in conformance with ASTM C 1028.
  - 1.4.1.1 Level Surfaces: Minimum of 0.6 (Wet).
  - 1.4.1.2 Step Treads: Minimum of 0.6 (Wet).
  - 1.4.1.3 Ramp Surfaces: Minimum of 0.8 (Wet).

#### 1.5 SUBMITTALS

- 1.5.1 Submit under provisions of Section 013000 – Submittal Procedures.
- 1.5.2 Product Data: Manufacturer's data sheets on each product to be used, including:
  - 1.5.2.1 Preparation instructions and recommendations.
  - 1.5.2.2 Storage and handling requirements and recommendations.
  - 1.5.2.3 Installation methods.
- 1.5.3 Shop Drawings: Indicate tile layout, patterns, color arrangement, perimeter conditions, junctions with dissimilar materials, control and expansion joints, thresholds, ceramic accessories, and setting details.
- 1.5.4 Selection Samples: Samples of actual tiles for selection.
- 1.5.5 Manufacturer's Certificate:
  - 1.5.5.1 Certify that products meet or exceed specified requirements.
  - 1.5.5.2 For each shipment, type and composition of tile provide a Master Grade Certificate signed by the manufacturer and the installer certifying that products meet or exceed the specified requirements of ANSI A137.1.
- 1.5.6 Maintenance Data: Include recommended cleaning methods, cleaning materials, stain removal methods, and polishes and waxes.

#### 1.6 QUALITY ASSURANCE

- 1.6.1 Installer Qualifications: Company specializing in performing the work of this section with minimum two years' experience.
- 1.6.2 Single Source Responsibility: Obtain each type and color of tile from a single source. Obtain each type and color of mortar, adhesive and grout from the same source.

#### 1.7 DELIVERY, STORAGE, AND HANDLING

- 1.7.1 Deliver and store products in manufacturer's unopened packaging until ready for installation.
- 1.7.2 Protect adhesives and liquid additives from freezing or overheating in accordance with manufacturer's instructions.

- 1.7.3 Store tile and setting materials on elevated platforms, under cover and in a dry location and protect from contamination, dampness, freezing or overheating.

## 1.8 ENVIRONMENTAL REQUIREMENTS

- 1.8.1 Do not install adhesives in an unventilated environment.
- 1.8.2 Maintain ambient and substrate temperature of 50 degrees F (10 degrees C) during tiling and for a minimum of 7 days after completion.

## 1.9 EXTRA MATERIALS

- 1.9.1 Provide for Owner's use a minimum of 2 percent of the primary sizes and colors of tile specified, boxed and clearly labeled.

## 2 PRODUCTS

### 2.1 MANUFACTURERS

- 2.1.1 Acceptable Manufacturer: Daltile Corporation, which is located at: 7834 C.F. Hawn Fwy. P. O. Box 170130; Dallas, TX 75217; Toll Free Tel: 800-933-TILE; Tel: 214-398-1411; Fax: 214-309-4584; Email: [request info \(eric hebert@mohawkind.com\)](mailto:request info (eric hebert@mohawkind.com)); Web: <https://www.daltile.com>
- 2.1.2 Requests for substitutions will be considered in accordance with provisions of Section 016000 – Material Manufacturer Substitution Policy.

### 2.2 TILE

- 2.2.1 General: Provide tile that complies with ANSI A137.1 for types, compositions and other characteristics indicated. Provide tile in the locations and of the types colors and pattern indicated on the Drawings and identified in the Schedule and the end of this Section. Tile shall also be provided in accordance with the following:
  - 2.2.1.1 Factory Blending: For tile exhibiting color variations within the ranges selected under Submittal of samples, blend tile in the factory and package so tile taken from one package shows the same range of colors as those taken from other packages.
  - 2.2.1.2 Mounting: For factory mounted tile, provide back or edge mounted tile assemblies as standard with the manufacturer, unless otherwise specified.
  - 2.2.1.3 Factory Applied Temporary Protective Coatings: Where indicated under tile type, protect exposed surfaces of tile against adherence of mortar and grout by pre-coating with a continuous film of petroleum paraffin wax applied hot. Do not coat unexposed tile surfaces.
- 2.2.2 ColorBody Porcelain Tile. As selected from the following choices:
  - 2.2.2.1 Product: City View.
  - 2.2.2.2 Product: Cliff Pointe.
  - 2.2.2.3 Product: Coastal Keystones.
  - 2.2.2.4 Product: Continental Slate.
  - 2.2.2.5 Product: Diamante.
  - 2.2.2.6 Product: Diplomacy.
  - 2.2.2.7 Product: EC1.
  - 2.2.2.8 Product: Elite.
  - 2.2.2.9 Product: Fabric Art
  - 2.2.2.10 Product: Fabrique.
  - 2.2.2.11 Product: Haut Monde.
  - 2.2.2.12 Product: Ironcraft.

- 2.2.2.13 Product: Keystones.
- 2.2.2.14 Product: Reminiscent.
- 2.2.2.15 Product: Unity.
- 2.2.2.16 Moisture Absorption: Less than .5 percent to less than 20 percent.
- 2.2.2.17 Size and Shape: 12 inches square, nominal.
- 2.2.2.18 Size and Shape: 13 inches square, nominal.
- 2.2.2.19 Size and Shape: 16 inches square, nominal.
- 2.2.2.20 Size and Shape: 18 inches square, nominal.
- 2.2.2.21 Size and Shape: 20 inches square, nominal.
- 2.2.2.22 Size and Shape: 24 inches square, nominal.
- 2.2.2.23 Size and Shape: 8 inches square, nominal.
- 2.2.2.24 Size and Shape: 6 inches square, nominal.
- 2.2.2.25 Size and Shape: 4 inches square, nominal.
- 2.2.2.26 Size and Shape: 3 inches square, nominal.
- 2.2.2.27 Size and Shape: 2 inches square, nominal.
- 2.2.2.28 Size and Shape: 1 inches square, nominal.
- 2.2.2.29 Surface Finish: Unpolished.
- 2.2.2.30 Colors: To be selected from manufacturer's standard range.
- 2.2.2.31 Trim Units: Matching bullnose, cove base corner, cove base outcorner, jolly, grooved bullnose, cement bullnose, fabric bullnose, shapes in sizes coordinated with field tile.

## 2.3 TRIM AND ACCESSORIES

- 2.3.1 Accessories: Same manufacturer as tile.
  - 2.3.1.1 Resin accessories including soap dish.
- 2.3.2 Metal Trim: Satin natural anodized extruded aluminum, stainless steel, brass, as selected, style and dimensions to suit application, for setting using tile mortar or adhesive; use in the following locations:
  - 2.3.2.1 Open edges of floor tile.
  - 2.3.2.2 Transition between floor finishes of different heights.
  - 2.3.2.3 Thresholds at door openings.
  - 2.3.2.4 Expansion and control joints, floor and wall.
- 2.3.3 Stone Thresholds: Provide stone thresholds uniform in color and finish and fabricated as follows:
  - 2.3.3.1 Material:
    - 2.3.3.1.1 Marble, complying with ASTM C 503 for exterior use and with a minimum abrasive hardness of 10 when tested in accordance with ASTM C 241.
  - 2.3.3.2 Color/Finish: As selected from the manufacturers standard range.
  - 2.3.3.3 Size:
    - 2.3.3.3.1 Fabricate 4 inches (100 mm) wide by full width of wall or frame opening; 1/2 inch (12 mm) thick; beveled one long edge with radiused corners on top side; without holes, cracks, or open seams.
  - 2.3.3.4 Provide transition between tile surface and adjoining finishes and at the following locations:
    - 2.3.3.4.1 At doorways where tile terminates.
    - 2.3.3.4.2 At open edges of floor tile where adjacent finish is a different height.

## 2.4 SETTING MATERIALS

- 2.4.1 Organic Adhesive: ANSI A136.1, thinset bond type; use Type I in areas subject to prolonged moisture exposure.
- 2.4.2 Epoxy Adhesive: ANSI A118.3, thinset bond type.

- 2.4.3 Mortar Bed Materials:
  - 2.4.3.1 Portland cement: ASTM C150, type 1, gray or white.
  - 2.4.3.2 Hydrated Lime: ASTM C207, Type S.
  - 2.4.3.3 Sand: ASTM C144, fine.
  - 2.4.3.4 Latex additive: As approved.
  - 2.4.3.5 Water: Clean and potable.
- 2.4.4 Mortar Bond Coat Materials:
  - 2.4.4.1 Dry-Set Portland Cement type: ANSI A118.1.
  - 2.4.4.2 Latex-Portland Cement type: ANSI A118.4.
  - 2.4.4.3 Epoxy: ANSI A118.3, 100 percent solids.
- 2.4.5 Standard Grout: Cement grout, sanded or unsanded, as specified in ANSI A118.6; color as selected.
- 2.4.6 Polymer modified cement grout, sanded or unsanded, as specified in ANSI A118.7; color as selected.
- 2.4.7 Epoxy Grout: ANSI A118.8, 100 percent solids epoxy grout; color as selected.
- 2.4.8 Silicone Sealant: Silicone sealant, moisture and mildew resistant type, white; use for shower floors and shower walls.
- 2.4.9 Cleavage Membrane:
  - 2.4.9.1 Polyethylene film, ASTM D4397, 4.0 mil thickness.
- 2.4.10 Waterproofing Membrane at Floors: Membrane in accordance with ANSI A118.10 and as follows:
  - 2.4.10.1 Chlorinated Polyethylene Sheet with polyester fabric reinforcing.
  - 2.4.10.2 Fabric Reinforced, Fluid-Applied elastomeric membrane.
  - 2.4.10.3 Un-Reinforced, Fluid-Applied elastomeric membrane.
  - 2.4.10.4 Polyethylene Sheet Product.
  - 2.4.10.5 Fabric-Reinforced, Modified-Bituminous Sheet Product.
  - 2.4.10.6 Urethane Waterproofing and Tile-Setting Adhesive Product.
- 2.4.11 Membrane at Walls: No. 15 (6.9 kg) asphalt saturated felt, ASTM D226, Type 1.
- 2.4.12 Membrane at Walls: 4 mil (0.1 mm) thick polyethylene film, ASTM D4397.
- 2.4.13 Membrane at Walls: Reinforced asphalt paper.
- 2.4.14 Reinforcing Mesh: 2 by 2 inch (50 by 50 mm) size weave of 16/16 wire size; welded fabric, galvanized.
- 2.4.15 Metal Lath: ASTM C847, Flat expanded diamond mesh, not less than 2.5 lbs/SY, galvanized finish.
- 2.4.16 Cementitious Backer Board: ANSI A118.9; High density, cementitious, glass fiber reinforced with 2 inch (50 mm) wide coated glass fiber tape for joints and corners:
  - 2.4.16.1 Thickness: 1/4 inch (6 mm).
  - 2.4.16.2 Thickness: 1/2 inch (13 mm).
  - 2.4.16.3 Thickness: 5/8 inch (16 mm).

### 3 EXECUTION

#### 3.1 EXAMINATION

- 3.1.1 Verify that wall surfaces are free of substances which would impair bonding of setting

materials, smooth and flat within tolerances specified in ANSI A137.1, and are ready to receive tile.

3.1.2 Verify that sub-floor surfaces are dust-free, and free of substances which would impair bonding of setting materials to sub-floor surfaces, and are smooth and flat within tolerances specified in ANSI A137.1.

3.1.3 Verify that concrete sub-floor surfaces are ready for tile installation by testing for moisture emission rate and alkalinity; obtain instructions if test results are not within limits recommended by tile manufacturer and setting materials manufacturer.

3.1.4 Verify that required floor-mounted utilities are in correct location.

### 3.2 PREPARATION

3.2.1 Protect surrounding work from damage.

3.2.2 Remove any curing compounds or other contaminants.

3.2.3 Vacuum clean surfaces and damp clean.

3.2.4 Seal substrate surface cracks with filler. Level existing substrate surfaces to acceptable flatness tolerances.

3.2.5 Install cementitious backer board in accordance with ANSI A108.11 and board manufacturer's instructions. Tape joints and corners, cover with skim coat of dry-set mortar to a feather edge.

3.2.6 Prepare substrate surfaces for adhesive installation in accordance with adhesive manufacturer's instructions.

### 3.3 INSTALLATION - GENERAL

3.3.1 Install tile and grout in accordance with applicable requirements of ANSI A108.1 through A108.13, manufacturer's instructions, and TCA Handbook recommendations.

3.3.2 Lay tile to pattern indicated. Arrange pattern so that a full tile or joint is centered on each wall and that no tile less than 1/2 width is used. Do not interrupt tile pattern through openings.

3.3.3 Cut and fit tile to penetrations through tile, leaving sealant joint space. Form corners and bases neatly. Align floor joints.

3.3.4 Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make joints watertight, without voids, cracks, excess mortar, or excess grout.

3.3.5 Form internal angles square and external angles bullnosed.

3.3.6 Install ceramic accessories rigidly in prepared openings.

3.3.7 Install non-ceramic trim in accordance with manufacturer's instructions.

3.3.8 Install thresholds where indicated.

3.3.9 Sound tile after setting. Replace hollow sounding units.

3.3.10 Keep expansion joints free of adhesive or grout. Apply sealant to joints.

3.3.11 Allow tile to set for a minimum of 48 hours prior to grouting.

- 3.3.12 Grout tile joints. Use standard grout unless otherwise indicated.
- 3.3.13 Apply sealant to junction of tile and dissimilar materials and junction of dissimilar planes.
- 3.4 INSTALLATION - FLOORS - THIN-SET METHODS
  - 3.4.1 Over interior concrete substrates, install in accordance with TCA Handbook Method F113, dry-set or latex-portland cement bond coat, with standard grout, unless otherwise indicated.
    - 3.4.1.1 With installation of waterproofing membrane, install in accordance with TCA Handbook Method F122, with latex-portland cement grout.
  - 3.4.2 Over wood substrates, install in accordance with TCA Handbook Method F142, with standard grout, unless otherwise indicated.
    - 3.4.2.1 Where epoxy bond coat and grout are indicated, install in accordance with TCA Handbook Method F143.
- 3.5 INSTALLATION - FLOORS - MORTAR BED METHODS
  - 3.5.1 Over interior concrete substrates, install in accordance with TCA Handbook Method F111, with cleavage membrane, unless otherwise indicated.
    - 3.5.1.1 Where waterproofing membrane is indicated, with standard grout or no mention of grout type, install in accordance with TCA Handbook Method F121.
  - 3.5.2 Over wood substrates, install in accordance with TCA Handbook method F141, with standard grout, unless otherwise indicated.
  - 3.5.3 Cleavage Membrane: Lap edges and ends.
  - 3.5.4 Waterproofing Membrane: Install as specified in ANSI A108.13.
  - 3.5.5 Mortar Bed Thickness: 1-1/4 to 2 inch (32 to 51 mm) maximum, unless otherwise indicated.
- 3.6 INSTALLATION - SHOWERS AND BATHTUB WALLS
  - 3.6.1 At tiled shower receptors install in accordance with TCA Handbook Method B415, mortar bed floor, and W244, thin-set over cementitious backer unit walls.
  - 3.6.2 At bathtub walls install in accordance with TCA Handbook Method B412, over cementitious backer units with waterproofing membrane.
  - 3.6.3 Grout with standard grout as specified above.
  - 3.6.4 Seal joints between tile work and other work with sealant specified in Section 07 90 00 - Joint Protection.
- 3.7 INSTALLATION - WALL TILE
  - 3.7.1 Over cementitious backer units on studs, install in accordance with TCA Handbook Method W244, using membrane at toilet rooms.
  - 3.7.2 Over cementitious backer units install in accordance with TCA Handbook Method W223, organic adhesive.
  - 3.7.3 Over gypsum wallboard on wood or metal studs install in accordance with TCA Handbook Method W243, thin-set with dry-set or latex-portland cement bond coat, unless otherwise indicated.
    - 3.7.3.1 Where mortar bed is indicated, install in accordance with TCA Handbook Method W222, one coat method.



- 3.7.3.2 Where waterproofing membrane is indicated other than at showers and bathtub walls, install in accordance with TCA Handbook Method W222, one coat method.
- 3.7.4 Over interior concrete and masonry install in accordance with TCA Handbook Method W202, thin-set with dry-set or latex-portland cement bond coat.
- 3.7.5 Over wood studs without backer install in accordance with TCA Handbook Method W231, mortar bed, with membrane where indicated.
- 3.7.6 Over metal studs without backer install in accordance with TCA Handbook Method W241, mortar bed, with membrane where indicated.
- 3.8 CLEANING
  - 3.8.1 Clean tile and grout surfaces.
- 3.9 PROTECTION OF FINISHED WORK
  - 3.9.1 Do not permit traffic over finished floor surface for 72 hours after installation.
  - 3.9.2 Cover floors with kraft paper and protect from dirt and residue from other trades.
  - 3.9.3 Where floor will be exposed for prolonged periods cover with plywood or other similar type walkways

END OF SECTION

**SECTION 095123**  
**ACOUSTICAL TILE CEILINGS**

**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 acoustical tiles for ceilings:
- B. Products furnished, but not installed under this Section, include anchors, clips, and other ceiling attachment devices.

**1.3 SUBMITTALS**

- A. Product Data: For each type of product indicated.
- B. Coordination Drawings: Reflected ceiling plans drawn to scale and coordinating penetrations and ceiling-mounted items. Show the following:
  - 1. Ceiling suspension assembly members.
  - 2. Method of attaching hangers to building structure.
  - 3. Ceiling-mounted items including lighting fixtures, diffusers, grilles, speakers, sprinklers, access panels, and special moldings.
  - 4. Minimum Drawing Scale: 1/8 inch = 1 foot.
- C. Samples for Verification: For each component indicated and for each exposed finish required, prepared on Samples of size indicated below.
  - 1. Acoustical Tile: Set of full-size Samples of each type, color, pattern, and texture.
  - 2. Exposed Moldings and Trim: Set of **12-inch-** (300-mm-) long Samples of each type and color.

**1.4 QUALITY ASSURANCE**

- A. Acoustical Testing Agency Qualifications: An independent testing laboratory, or an NVLAP-accredited laboratory, with the experience and capability to conduct the testing indicated, as documented according to ASTM E 548. NVLAP-accredited laboratories must document accreditation, based on a "Certificate of Accreditation" and a "Scope of Accreditation" listing the test methods specified.
- B. Fire-Test-Response Characteristics: Provide acoustical tile ceilings that comply with the following requirements:

1. Fire-Resistance Characteristics: Where indicated, provide acoustical tile ceilings identical to those of assemblies tested for fire resistance per ASTM E 119 by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.
  - a. Fire-Resistance Ratings: Indicated by design designations from UL's "Fire Resistance Directory" or from the listings of another testing and inspecting agency.

## 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver acoustical tiles, suspension system components, and accessories to Project site in original, unopened packages and store them in a fully enclosed, conditioned space where they will be protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.
- B. Before installing acoustical tiles, permit them to reach room temperature and a stabilized moisture content.

## 1.6 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install acoustical tile ceilings until spaces are enclosed and weatherproof, wet work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

## 1.7 COORDINATION

- A. Coordinate layout and installation of acoustical tiles and suspension system with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire-suppression system, and partition assemblies.

## 1.8 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. Acoustical Ceiling Units: Full-size units equal to 5.0 percent of quantity installed.
  2. Suspension System Components: Quantity of each concealed grid and exposed component equal to 2.0 percent of quantity installed.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Manufacturer: Armstrong World Industries, Inc. Grenoble or equivalent.

## 2.2 ACOUSTICAL TILES, GENERAL

- A. Acoustical Tile Standard: Provide manufacturer's standard tiles of configuration indicated that comply with ASTM E 1264 classifications as designated by types, patterns, acoustical ratings, and light reflectances, unless otherwise indicated.
- B. Tile-Based Antimicrobial Treatment: Provide acoustical tiles treated with manufacturer's standard antimicrobial solution that inhibits fungus, mold, mildew, and gram-positive and gram-negative bacteria.

## 2.3 METAL SUSPENSION SYSTEM FOR ACOUSTICAL TILE CEILING ATC

- A. Products: Subject to compliance with requirements, provide the following:
  - 1. Armstrong 584 24x24x5/8 Cirrus, Angled Tegular, color: Selected by owner from following options (or current full selection):
    - a. Camel
    - b. Cream
    - c. Haze
    - d. Platinum
    - e. White
- B. Direct-Hung, Suspension System: Main and cross runners roll formed from and capped with cold-rolled steel sheet, prepainted, electrolytic zinc coated, or hot-dip galvanized according to ASTM A 653/A 653M, **G30 (Z90)** coating designation.
  - 1. Structural Classification: Intermediate-duty system.

## 2.4 METAL EDGE MOLDINGS AND TRIM

- A. Manufacturers:
  - 1. Armstrong.
  - 2. Chicago Metallic Corporation.
  - 3. Fry Reglet Corporation.
  - 4. Gordon, Inc.
  - 5. MM Systems, Inc.
  - 6. USG Interiors, Inc.
  - 7. Or equivalent
- B. Roll-Formed Sheet-Metal Edge Moldings and Trim: Type and profile indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations that fit acoustical tile edge details and suspension systems indicated; formed from sheet metal of same material and finish as that used for exposed flanges of suspension system runners.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, including structural framing and substrates to which acoustical tile ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage and with requirements for installation tolerances and other conditions affecting performance of acoustical tile ceilings.

### 3.2 PREPARATION

- A. Testing Substrates: Before installing adhesively applied tiles on wet-placed substrates such as cast-in-place concrete or plaster, test and verify that moisture level is below tile manufacturer's recommended limits.
- B. Measure each ceiling area and establish layout of acoustical tiles to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width tiles at borders, and comply with layout shown on reflected ceiling plans.

### 3.3 INSTALLATION, SUSPENDED ACOUSTICAL TILE CEILINGS

- A. General: Install acoustical tile ceilings to comply with ASTM C 636 UBC Standard 25-2, per manufacturer's written instructions and CISCA's "Ceiling Systems Handbook."
- B. Suspend ceiling hangers from building's 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 structure or of ceiling suspension system.
  - 2. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
  - 3. Splay hangers only where required and, if permitted with fire-resistance-rated ceilings, to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
  - 4. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings 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 and publications.
  - 5. Secure wire hangers to ceiling suspension members and to supports above with a minimum of three tight turns. Connect hangers directly either to structures or to inserts, eye screws, or other devices that are secure and appropriate for substrate and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
  - 6. Secure flat, angle, channel, and rod hangers to structure, including intermediate framing members, by attaching to inserts, eye screws, or

other devices that are secure and appropriate for both structure to which hangers are attached and type of hanger involved. Install hangers in a manner that will not cause them to deteriorate or fail due to age, corrosion, or elevated temperatures.

7. Space hangers not more than **48 inches (1200 mm)** o.c. along each member supported directly from hangers, unless otherwise indicated; provide hangers not more than **8 inches (200 mm)** from ends of each member.
- C. Secure bracing wires to ceiling suspension members and to supports with a minimum of four tight turns. Suspend bracing from building's structural members as required for hangers, without attaching to permanent metal forms, steel deck, or steel deck tabs. Fasten bracing wires into concrete with cast-in-place or postinstalled anchors.
- D. Install edge moldings and trim of type indicated at perimeter of acoustical tile ceiling area and where necessary to conceal edges of acoustical units.
  1. Apply acoustical sealant in a continuous ribbon concealed on back of vertical legs of moldings before they are installed.

### 3.4 CLEANING

- A. Clean exposed surfaces of acoustical tile ceilings, including trim and edge moldings. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage. Remove and replace tiles and other ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION

## **SECTION 099123**

### **PAINTING**

#### **PART 1 - GENERAL**

##### **1.1 SUMMARY**

A. Section includes:

1. Paint.

##### **1.2 ENVIRONMENTAL CONDITIONS**

A. Utilize a low VOC product, (less than 100 g/1), for semi-gloss and gloss. Use a water-based, "zero VOC" product (less than 10 g/1), for flat and egg shell. All interior and exterior paints shall be lead and VOC free.

##### **1.3 SUBMITTALS**

A. Product Data: Provide material specifications, characteristics, and instructions for using adhesives and grouts.

##### **1.4 EXTRA MATERIALS**

A. Provide one gallon of each color and sheen in unopened cans, sealed and labeled by manufacturer.

##### **1.5 DELIVERY, STORAGE AND HANDLING**

- A. All materials must be of commercial grade made by reputable, recognized manufacturers, and delivered to the job in original containers bearing brand name and manufacturer's name with seals unbroken and unusable materials.
- B. Store materials and equipment only at locations as directed. Keep storage spaces clean and orderly and free of debris and unusable materials.
- C. Deliver materials in original packages, containers, or bundles bearing brand names and identification of manufacturer or supplier.
- D. Store materials in dry location, fully protected from weather and direct exposure to sunlight.
- E. Use paint directly from manufacturer – Do not add water or otherwise thin paint materials.

##### **1.6 WARRANTY**

- A. The Contractor shall furnish written guarantee that all work, materials and workmanship required by this section of the contract be free from defects for a period of one (1) year after the acceptance of the building.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. Manufacturers:
  - 1. PPG paint and coating systems (or equivalent).
  - 2. MAB (M. A. Bruder) paint systems (or equivalent).
  - 3. Benjamin Moore "Pristine" paint line with zero VOC content (or equivalent).
- B. Coatings: All coatings shall be pre-mixed, except field catalyzed coatings of good flow and brushing properties, capable of drying or curing free of streaks or sags. All coatings shall be lead-free.
- C. Accessory Materials: Linseed oil, shellac, turpentine, paint thinners and other materials required to achieve the finishes specified.

### 2.2 FINISHES

- A. All colors shall be selected by Owner.
- B. Refer to schedule at end of section for surface finish schedule.
- C. All new wood and steel doors shall be primed and painted with semi-gloss finish.
- D. Interior walls shall be primed and painted with eggshell or low luster finish.
- E. All exterior trims shall be primed and painted with semi-gloss finish.
- F. Provide three (3) color paint system for interior spaces; one (1) color for walls and ceilings, one (1) color for doors, and one (1) color for trim.

### 2.3 CLEAR FINISH / STAINS

- A. Stains shall be vegetable oil based, non-polyurethane, waterborne for exterior use with UV protection.
- B. Clear finish interior wood to be 2 coats clear shellac, plus 1 coat MAB Dull-Glo Varnish (or equivalent).

## PART 3 - EXECUTION



### 3.1 EXAMINATION AND PREPARATION

- A. Verify that substrate conditions are ready to receive work.
- B. Measure moisture content of porous surfaces using an electronic moisture meter. Do not apply finishes unless moisture content is less than 12 percent.
- C. Correct minor defects and clean surfaces which affect work of this Section.
- D. Remove electrical plates, hardware, light fixture trim, escutcheons, and fittings prior to preparing surfaces or finishing.
- E. Gypsum Board Surfaces: Fill minor defects with latex compounds. Spot prime defects after repair.
- F. Galvanized Surfaces: Remove surface contamination and oils and wash with solvent. Apply coat of etching primer.
- G. Concrete and Unit Masonry Surfaces Scheduled to Receive Paint Finish: Remove foreign matter. Remove oil and grease with a solution of tri-sodium phosphate, rinse well and allow to dry.
- H. Uncoated Ferrous Surfaces: Remove scale by wire brushing, sandblasting, clean by washing with solvent. Apply treatment of phosphoric acid solution. Prime paint after repairs.
- I. Shop Primed Steel Surfaces: Sand and scrape to remove loose primer and rust, hand power tool clean, clean surfaces with solvent. Prime bare steel surfaces.
- J. Interior Wood Items Scheduled to Receive Paint Finish: Wipe off dust and grit prior to priming. Seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after primer has dried; sand between coats.
- K. Interior Wood Items Scheduled to Receive Transparent Finish: Wipe off dust and grit prior to sealing. Seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after sealer has dried; sand lighting between coats.
- L. Exterior Wood Scheduled to Receive Paint Finish: Remove dust, grit, and foreign matter. Seal knots, pitch streaks, and sappy sections. Fill nail holes with tinted exterior caulking compound after prime coat has been applied.
- M. Protect adjacent work from damage.
- N. Prepare all surfaces in accordance with manufacturer's requirements.

### 3.2 APPLICATION

- A. All paints shall be premixed. Paints shall not be thinned with water.
- B. New painting shall be performed by experienced mechanics using roller, spray (with back roll on second coat) or brush, applying paint according to

manufacturer's instructions, free of runs, sags, holidays and brush or roller markings.

- C. Sand transparent finishes lightly between coats to achieve required finish.
- D. Where clear finishes are required, tint fillers to match wood.
- E. Back prime interior and exterior wood work scheduled to receive paint finish with primer paint.
- F. Back prime interior woodwork scheduled to receive stain or varnish finish with gloss varnish reduced 25 percent with mineral spirits.
- G. Finished surfaces shall be finished to a straight line where adjoining other colors or unpainted surfaces.
- H. Fill cracks, nail holes, and other defects in wood with whiting putty after prime coat has been applied.
- I. No exterior work to be done in rainy, damp, or frosty weather. No interior work to be done until building is dry.
- J. All wood doors shall be primed and painted with a high gloss protective finish. Give top and bottom edges of doors the same number of finish coats as face. Paint prime coated butts the same as door frame unless otherwise directed.
- K. Paint access doors, panelboards, grilles, exposed piping and similar items to match adjacent surfaces unless otherwise directed.
- L. Give any finished work that does not have full coverage or is not neat and workmanlike additional coats of finish or remove entirely and re-do as required by Architect until it presents a satisfactory and acceptable appearance.

### 3.3 FINISHING MECHANICAL AND ELECTRICAL EQUIPMENT

- A. Paint shop primed equipment.
- B. Remove unfinished louvers, grilles, covers, and access panels and paint separately.
- C. Prime and paint exposed pipes, exposed ducts, hangers, brackets, collars and supports, except where items are pre-finished.
- D. Paint both sides and edges of plywood backboards.
- E. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

### 3.4 CLEANING

- A. As work proceeds, promptly remove finishes where spilled, splashed, or spattered.
- B. Store paint rags and waste in tightly covered metal containers or remove from job site at end of each day's work.

### 3.5 PAINT SCHEDULE - EXTERIOR SURFACES

- A. Steel - ferrous metal (or equivalent):
  - 1. Two (2) coats PPG 3330 Durethane Mastic Urethane, self priming.
- B. Steel - galvanized metal:
  - 1. Two (2) coats PPG 3330 Durethane Mastic Urethane, self priming.
- C. Garage Door
  - 1. One (1) coat PPF Paints Amerlock Sealer at 1.0 mils dry.
  - 2. One (1) coat PPF Paints Durethane DTM 95-3330 Series.

### 3.6 PAINT SCHEDULE - INTERIOR SURFACES

- A. Steel - Unprimed:
  - 1. One (1) coat PPG 4020PF, PitTech Plus Primer/Finish w/ Acrylic.
  - 2. Two (2) coats PPF 4216HP, Acrylic Enamel Sem-Gloss.
- B. Concrete, concrete block:
  - 1. One (1) coat of block filler, PPG 6-15XI.
  - 2. Two (2) coats of PPG Sun-Proof 7 Series, semi-gloss
- C. Gypsum Board:
  - 1. One (1) coat of acrylic enamel primer. PPG 4-4900 (or equivalent).
  - 2. Two (2) PPG 4310 XI Speedhide, No VOC, eggshell (or equivalent).
- D. Concrete floors (not receiving another flooring)
  - 1. PPG Perma Crete Plexseal WB Interior/Exterior Clear Sealer
- E. Exposed Pipe and Fittings:
  - 1. Two (2) coats semi-gloss enamel.

END OF SECTION

## **SECTION 101400 INTERIOR SIGNAGE**

### **PART 1 GENERAL**

#### **1.1 SECTION INCLUDES**

- A. Room signs.

#### **1.2 REFERENCES**

- A. American National Standards Institute (ANSI): ANSI A117.1 - Specifications for Making Buildings and Facilities Accessible to and Usable by Physically Handicapped People.
- B. Architectural and Transportation Barriers Compliance Board (ATBCB): Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities (ADAAG).

#### **1.3 SUBMITTALS**

- A. Submit under provisions of Section 013000 - Administrative Requirements.
- B. [ Product Data ]: Manufacturer's data sheets on each product to be used, including:
  - 1. Installation methods.
  - 2. Maintenance methods.
  - 3. Cleaning methods.
- C. Shop Drawings: Submit shop drawings for each sign type to be used, including:
  - 1. Show layout, profiles, and product components, including edge conditions, accessories, finish colors, and textures.
  - 2. Show sign mounting types, heights, anchorage methods, and attachment devices.
- D. Selection Samples: For each finish product specified, two full-size signs representing manufacturer's full range of available colors and patterns.
- E. Sign Schedule: Use designations indicated on in Schedule below..

#### **1.4 QUALITY ASSURANCE**

- A. Regulatory Requirements: Signage shall comply with applicable requirements of ADAAG and ANSI A117.1

#### **1.5 DELIVERY, STORAGE, AND HANDLING**

- A. Store products in accordance with manufacturer's requirements.
- B. Store products in manufacturer's unopened packaging with labels intact until ready for installation.
- C. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having

jurisdiction.

## 1.6 PROJECT CONDITIONS

- A. Environmental Requirements: 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.

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

- A. Acceptable Manufacturer, U.S.: Seton Identification Products
- B. Requests for substitutions will be considered in accordance with provisions of Section 016000 - Product Requirements.

### 2.2 INTERIOR SIGNAGE

- A. Sign Type 1: Custom Optima Facility Braille Signs as manufactured by Seton Identification Products.
  - 1. Style: JN012
  - 2. Face Material: Setonflex flexible, stain-resistant, multi-layer acrylic treated for outdoor use.
  - 3. Colors: Face color Selected by Owner; graphics and letter color Selected by Owner.
  - 4. Sign Size: 7.75 inches by 3.25 inches.
  - 5. Lettering Style: Selected by Owner.
  - 6. Mounting Style: Adhesive
  - 7. Accessories: Installation accessories specified in manufacturer's instructions.
- B. Sign Type 2: Custom Optima Facility Braille Signs as manufactured by Seton Identification Products.
  - 1. Style: JN012
  - 2. Face Material: Setonflex flexible, stain-resistant, multi-layer acrylic treated for outdoor use.
  - 3. Colors: Face color Selected by Owner; graphics and letter color Selected by Owner.
  - 4. Sign Size: 11.75 inches by 3.25 inches.
  - 5. Lettering Style: Selected by Owner.

6. Mounting Style: Adhesive
  7. Accessories: Installation accessories specified in manufacturer's instructions.
- C. Sign Type 3: Custom Sized Braille Signs as manufactured by Seton Identification Products.
1. Style: L2852
  2. Face Material: Setonflex flexible, stain-resistant, multi-layer acrylic treated for outdoor use.
  3. Colors: Face color Selected by Owner; graphics and letter color Selected by Owner.
  4. Sign Size: 10 inches by 10 inches.
  5. Lettering Style: Selected by Owner.
  6. Mounting Style: Adhesive
  7. Accessories: Installation accessories specified in manufacturer's instructions.
- D. Sign Type 4: In Case Of Fire Use Stairs – Economy Braille Signs as manufactured by Seton Identification Products.
1. Style: 84584
  2. Face Material: Plastic.
  3. Colors: Face color Blue; graphics and letter color White.
  4. Sign Size: 6 inches by 9 inches.
  5. Lettering Style: Selected by Owner.
  6. Mounting Style: Adhesive
  7. Accessories: Installation accessories specified in manufacturer's instructions.
- E. Sign Type 5: Optima ADA Restroom Sign (“Men” or “Women” as manufactured by Seton Identification Products.
1. Style: 7503B
  2. Face Material: Setonflex flexible, stain-resistant, multi-layer acrylic treated for outdoor use.
  3. Colors: Face color MedX300 Blue; graphics and letter color White.

4. Sign Size: 7.5 inches by 7.5 inches.
  5. Lettering Style: Selected by Owner.
  6. Mounting Style: Adhesive
  7. Accessories: Installation accessories specified in manufacturer's instructions.
- F. Sign Type 6: Handicap Restroom Signs – Double Faced as manufactured by Seton Identification Products.
1. Style: 35673
  2. Face Material: Vinyl.
  3. Colors: Face color Blue; graphics and letter color White.
  4. Sign Size: 7.5 inches by 7.5 inches.
  5. Lettering Style: Selected by Owner.
  6. Mounting Style: Adhesive
  7. Accessories: Installation accessories specified in manufacturer's instructions.
- G. Sign Type 7: Emergency Exit Only Alarm Will Sound – glow in the dark fire exit sign as manufactured by Seton Identification Products.
1. Style: 97768
  2. Face Material: Plastic.
  3. Colors: Face color Luminous; graphics and letter color Red.
  4. Sign Size: 5 inches by 8 inches.
  5. Lettering Style: Selected by Owner.
  6. Mounting Style: Adhesive
  7. Accessories: Installation accessories specified in manufacturer's instructions.

### 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.

### 3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Locate signs in accordance with ADAAG requirements.
- C. Install signs plumb and square.

### 3.4 PROTECTION

- A. Protect installed products until completion of project.
- B. Repair or replace damaged products before Substantial Completion.

### 3.5 SCHEDULES

- A. Signage Schedule as follows:

- 1. Signs listed below to be placed on wall adjacent to door on exterior, handle side, or as indicated, or where directed by Owner.

Room signs shall be as listed in the ROOM SCHEDULE included in the Contract Documents with the following exceptions:

Basement:

Room 001 COMMUNITY/DINING SPACE:

Sign Type: 6

Text: RESTROOMS

Location: Mounted high on privacy wall in front of bathroom doors.

Door 012:

Sign Type: 5

Text: WOMEN

Location: Adjacent to Women's Room door.



Door 011:  
Sign Type: 5  
Text: MEN  
Location: Adjacent to Men's Room door.

Door 013:  
Sign Type: 2  
Text: UTILITY  
Location: Adjacent to Utility room door.

Door 009:  
Sign Type: 2  
Text: KITCHEN  
Location: Adjacent to Kitchen door.

Door 008:  
Sign Type: 2  
Text: CUSTODIAL  
Location: Adjacent to Janitor's Closet door.

Door 002:  
Sign Type: 2  
Text: UTILITY  
Location: Adjacent to Furnace/Electrical door.

Room 009:  
Sign Type: 2  
Text: LAUNDRY  
Location: Adjacent to Laundry Room entry opening in Corridor 006.

Door 007:  
Sign Type: 2  
Text: PROGRAMS  
Location: Adjacent to Program Space door.

Door 003:  
Sign Type: 2  
Text: STORAGE 001  
Location: Adjacent to Storage Room 003 door.

Door 006:  
Sign Type: 2  
Text: STORAGE 007  
Location: Adjacent to Storage Room 007 door.

Door 004:  
Sign Type: 2  
Text: ELEVATOR MACHINE ROOM  
Location: Adjacent to Elevator Machine Room door.

Door 014:  
Sign Type: 2  
Text: UTILITY  
Location: Adjacent to Utility room door.

First Floor:

Door 110:  
Sign Type: 1  
Text: SUITE 100  
Location: Adjacent to door 110.

Door 109:  
Sign Type: 1  
Text: SUITE 101  
Location: Adjacent to door 109.

Door 108:  
Sign Type: 1  
Text: SUITE 102  
Location: Adjacent to door 108.

Door 107:  
Sign Type: 1  
Text: SUITE 103  
Location: Adjacent to door 107

Door 106:  
Sign Type: 1  
Text: SUITE 105  
Location: Adjacent to door 105.

Door 105:  
Sign Type: 2  
Text: SERVER ROOM  
Location: Adjacent to door 105.

Door 104:  
Sign Type: 1  
Text: SUITE 106  
Location: Adjacent to door 104.

Door 103:  
Sign Type: 1  
Text: OFFICE 100  
Location: Adjacent to door 103

Door 102:  
Sign Type: 2  
Text: MEETING ROOM  
Location: Adjacent to door 102.

Door 101:  
Sign Type: 2  
Text: MEETING ROOM  
Location: Adjacent to door 101.

Door 123:  
Sign Type: 4  
Text: IN CASE OF FIRE USE STAIRS  
Location: Adjacent to door 123.

Door 123:  
Sign Type: 7  
Text: EMERGENCY EXIT ONLY. ALARM WILL SOUND WHEN  
DOOR IS OPENED.  
Location: Adjacent to door 100.

Door 122:  
Sign Type: 1  
Text: SUITE 107  
Location: Adjacent to door 122.

Door 121:  
Sign Type: 3  
Text: BATHING  
Location: Adjacent to door 121.

Door 120:  
Sign Type: 2  
Text: CUSTODIAL  
Location: Adjacent to door 120.

Door 118:  
Sign Type: 2  
Text: ADMINISTRATION  
Location: Adjacent to door 118.

Door 117:  
Sign Type: 2  
Text: ADMINISTRATION  
Location: Adjacent to door 117.

Door 115:  
Sign Type: 2  
Text: SECURITY  
Location: Adjacent to door 115.

- Door 114:  
Sign Type: 1  
Text: SUITE 104  
Location: Adjacent to door 114.
- Door 113:  
Sign Type: 3  
Text: BATHING  
Location: Adjacent to door 113.
- Door 112:  
Sign Type: 4  
Text: IN CASE OF FIRE USE STAIRS  
Location: Adjacent to door 112.
- Door 112:  
Sign Type: 7  
Text: EMERGENCY EXIT ONLY. ALARM WILL SOUND WHEN  
DOOR IS OPENED.  
Location: Eye level on door 112.

Second Floor:

- Door 213:  
Sign Type: 1  
Text: SUITE 200  
Location: Adjacent to door 213.
- Door 214:  
Sign Type: 1  
Text: SUITE 201  
Location: Adjacent to door 214.
- Door 215:  
Sign Type: 3  
Text: BATHING  
Location: Adjacent to door 215.
- Door 216:  
Sign Type: 1  
Text: SUITE 205  
Location: Adjacent to door 216.
- Door 217:  
Sign Type: 2  
Text: ADMINISTRATION 200  
Location: Adjacent to door 217.

Door 218:  
Sign Type: 2  
Text: CUSTODIAL  
Location: Adjacent to door 218.

Door 219:  
Sign Type: 2  
Text: ADMINISTRATION 201  
Location: Adjacent to door 219.

Door 220:  
Sign Type: 2  
Text: ADMINISTRATION 202  
Location: Adjacent to door 220.

Door 221:  
Sign Type: 3  
Text: BATHING  
Location: Adjacent to door 221.

Door 222:  
Sign Type: 1  
Text: SUITE 211  
Location: Adjacent to door 222.

Door 223:  
Sign Type: 1  
Text: SUITE 213  
Location: Adjacent to door 223.

Door 224:  
Sign Type: 4  
Text: IN CASE OF FIRE USE STAIRS  
Location: Adjacent to door 224.

Door 224:  
Sign Type: 7  
Text: EMERGENCY EXIT ONLY. ALARM WILL SOUND WHEN  
DOOR IS OPENED.  
Location: Eye level on door 224.

Door 200:  
Sign Type: 1  
Text: SUITE 214  
Location: Adjacent to door 200.

Door 201:  
Sign Type: 1  
Text: SUITE 212  
Location: Adjacent to door 201.

Door 202:  
Sign Type: 1  
Text: SUITE 210  
Location: Adjacent to door 202.

Door 203:  
Sign Type: 1  
Text: SUITE 209  
Location: Adjacent to door 203.

Door 204:  
Sign Type: 1  
Text: SUITE 208  
Location: Adjacent to door 204.

Door 205:  
Sign Type: 1  
Text: SUITE 207  
Location: Adjacent to door 205.

Door 206:  
Sign Type: 2  
Text: UTILITY  
Location: Adjacent to door 206.

Door 207:  
Sign Type: 2  
Text: STORAGE  
Location: Adjacent to door 207.

Door 208:  
Sign Type: 1  
Text: SUITE 206  
Location: Adjacent to door 208.

Door 209:  
Sign Type: 1  
Text: SUITE 204  
Location: Adjacent to door 209.

Door 210:  
Sign Type: 1  
Text: SUITE 203  
Location: Adjacent to door 210.

Door 211:  
Sign Type: 1  
Text: SUITE 202  
Location: Adjacent to door 211.

Door 212:

Sign Type: 4

Text: IN CASE OF FIRE USE STAIRS

Location: Adjacent to door 212.

Door 212:

Sign Type: 7

Text: EMERGENCY EXIT ONLY. ALARM WILL SOUND WHEN  
DOOR IS OPENED.

Location: Eye level on door 212.

END OF SECTION

**SECTION 102000**  
**MISCELLANEOUS ACCESSORIES**

**PART 1 - GENERAL**

**1.1 SECTION INCLUDES**

- A. Fire extinguishers and cabinets.

**1.2 SUBMITTALS**

- A. Product Data: Provide data on products and specified accessories.

**1.3 QUALITY ASSURANCE**

- A. Fire Extinguishers: Conform to NFPA 10.

**PART 2 - PRODUCTS**

**2.1 FIRE EXTINGUISHERS**

- A. Manufacturers (or equivalent):
  - 1. J. L. Industries, (612) 835-6850.
  - 2. Johnson-Lee, Division of W. F. Lee Corp.
  - 3. Larsen's Manufacturing Co..
- B. Dry Chemical Type: Stainless steel tank, with pressure gage, UL-rated 4-A, 60-B:C, 10 lb. capacity, for Class A, B, C fires in common areas. Provide a 5 lb. ABC type extinguishers in each apartment (in the cabinet below the sink), (no hook or cabinet).
- C. Fire extinguisher cabinets as manufactured by Ambassador, or approved equal.
- D. Manufacturer's standard units of suitable size for housing fire extinguishers of type and capacity indicated and as follows:
  - 1. Cabinet Type
    - a. Stud partition: Cabinet box partly recessed with recessed vision panel; min 4" recess.
    - b. CMU partition: Cabinet box flush mounted with vision panel.
  - 2. Provide keyed lock for each cabinet.
  - 3. Larson "Flame-Shield" at locations required fire rated installation.
  - 4. In service areas (non-resident and non-public areas) install all extinguishers on wall hooks.



5. Refer to drawings for locations.
- E. Exposed Trim: One-piece combination trim and perimeter door frame overlapping surrounding wall surface.
  1. Rolled Edge Trim: Square edges with backbend of 2-1/2".
- F. Factory Finishing of Fire Extinguisher Cabinets: Comply with NAAMM "Metal Finishes Manual" to provide uniformly finished products. Provide color as indicated.
  1. Baked enamel finish: Color to be white.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION AND PREPARATION

- A. Verify that surfaces and internal wall blocking are ready to receive work and opening dimensions are as indicated on drawings and instructed by the manufacturer.

#### 3.2 INSTALLATION - FIRE EXTINGUISHERS

- A. Install extinguishers in accordance with manufacturer's instructions.
- B. Install units level in wall openings.
- C. Top of unit less than or equal to 5-feet above floor. Bottom of unit must be at least 4-feet above floor.

#### 3.4 SCHEDULE

- A. Provide fire extinguishers, as shown on the drawings.

END OF SECTION

## **SECTION 102116**

### **SOLID PLASTIC TOILET COMPARTMENTS**

#### **PART 1 GENERAL**

##### **1.1 SUMMARY**

- A. Section Includes:
  - 1. Solid plastic toilet compartments and urinal screens.

##### **1.2 REFERENCES**

- A. ASTM International (ASTM):
  - 1. A167 - Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
  - 2. B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
  - 3. E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
- B. National Fire Protection Association (NFPA) 286 - Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth.

##### **1.3 SYSTEM DESCRIPTION**

- A. Compartment Configurations:
  - 1. Toilet partitions: Floor mounted, overhead braced.
  - 2. Urinal screens: Wall mounted.

##### **1.4 SUBMITTALS**

- A. Submittals for Review:
  - 1. Shop Drawings: Include dimensioned layout, elevations, trim, closures, and accessories.
  - 2. Product Data: Manufacturer's descriptive data for panels, hardware, and accessories.
  - 3. Samples: [2 x 3] inch samples showing available colors.

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

- A. Manufacturer Qualifications: Minimum (5) five years experience in manufacture of solid plastic toilet compartments with products in satisfactory use under similar service conditions.
- B. Installer Qualifications: Minimum (5) five years experience in work of this Section.

## 1.6 WARRANTIES

- A. Provide manufacturer's 25 year warranty against breakage, corrosion, and delamination under normal conditions.

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

- A. Acceptable manufacturer: Scranton Products "Hiny Hiders" (or equivalent).  
[www.scrantonproducts.com](http://www.scrantonproducts.com)
- B. Substitutions: Under provisions of Division 016000.

### 2.2 MATERIALS

- A. Doors, Panels and Pilasters:
  - 1. High density polyethylene (HDPE), fabricated from polymer resins compounded under high pressure, forming single thickness panel.
  - 2. Waterproof and nonabsorbent, with self-lubricating surface, resistant to marks by pens, pencils, markers, and other writing instruments.
  - 3. 1 inch thick with edges rounded to 1/4 inch radius.
  - 4. Fire hazard classification: Class [A] [B] flame spread/smoke developed rating, tested to ASTM E84.
  - 5. Color: To be selected from manufacturer's full color range.
- B. Aluminum Extrusions: ASTM B221, 6463-T5 alloy and temper.
- C. Stainless Steel: ASTM A167, Type 304.

### 2.3 HARDWARE

- A. Hinges: Regal hinge fabricated from heavy-duty cast aluminum, wrap around flanges, adjustable on 30-degree increments, through bolted to doors and pilasters.
- B. Door Strike and Keeper:
  - 1. 6 inches long, fabricate from heavy-duty extruded aluminum with bright dip anodized finish, with wrap-around flanges secured to pilasters with stainless steel tamper resistant Torx head sex bolts.
  - 2. Bumper: Extruded black vinyl.
  - 3. Slide latch and paddle.
- C. Coat Hook/Bumper:
  - 1. Combination type, chrome plated Zamak.
  - 2. Equip outswing handicapped doors with second door pull and door stop.
- D. Door Pulls: Chrome plated Zamak.

## 2.4 COMPONENTS

- A. Doors and Dividing Panels: 55 inches high, mounted 14 inches above finished floor.
- B. Pilasters: 82 inches high, fastened to pilaster sleeves with stainless steel tamper resistant Torx head sex bolt.
- C. Pilaster Sleeves: 3 inches high, 20 gage stainless steel, secured to pilaster with stainless steel tamper resistant Torx head sex bolt.
- D. Wall Brackets: 54 inches long, heavy-duty aluminum, bright dip anodized finish, fastened to pilasters and panels with stainless steel tamper resistant Torx head sex bolts.
- E. Headrail: Heavy-duty extruded aluminum, anti-grip design, clear anodized finish, fastened to headrail bracket with stainless steel tamper resistant Torx head sex bolt and at top of pilaster with stainless steel tamper resistant Torx head screws.
- F. Headrail Brackets: 20 gage stainless steel, satin finish, secured to wall with stainless steel tamper resistant Torx head screws.

## PART 3 EXECUTION

### 3.1 INSTALLATION

- A. Install compartments in accordance with manufacturer's instructions and approved Shop Drawings.
- B. Install rigid, straight, plumb, and level.
- C. Locate bottom edge of doors and panels 14 inches above finished floor.
- D. Provide uniform, maximum 3/8 inch vertical clearance at doors.
- E. Not Acceptable: Evidence of cutting, drilling, or patching.

### 3.2 ADJUSTING

- A. Adjust doors and latches to operate correctly.

END OF SECTION

## **SECTION 102813**

### **TOILET AND BATH ACCESSORIES**

#### **PART 1 - GENERAL**

##### **1.1 SUMMARY**

- A. Section includes:
  - 1. Toilet and bath accessories.

##### **1.2 REFERENCES**

- A. Conform to NJ Uniform Construction Code for installing work in conformance with ANSI A117.1.

##### **1.3 SUBMITTALS**

- A. Product Data: Provide material specifications, characteristics, and installation directions.
- B. Samples: Submit two (2) samples of each component illustrating color and finish.

##### **1.4 WORK INCLUDED**

- A. Provide all labor, superintendence, materials, tools, transportation, and equipment and all means of construction necessary and reasonably incidental to complete the work as specified herein and as shown on the Contract Drawings.
- B. All materials and labor obviously a part of the work, and as necessary for proper installation and/or operation of same, although not specifically indicated on the Contract Drawings and/or in the Specifications shall be provided by the Contractor as if called in detail without additional cost to the Owner.

#### **PART 2 - PRODUCTS**

##### **2.1 MATERIALS**

- A. Manufacturers: Subject to compliance with requirements, provide accessories by one (1) of the following or approved equal:
  - 1. Taymor Industries.
  - 2. Bobrick Washroom Equipment, Inc.
  - 3. AJ Washroom Accessories
  - 4. Bradley Corp.
- B. Mirror Glass: Clear, tempered safety type with copper and silver coating, organic over-coating, beveled edges.

- C. Stamped metals are not permitted.

## 2.2 FABRICATION

- A. Form surfaces flat without distortion. Weld and grind joints smooth.
- B. Shop assemble components and package with anchors and fittings.
- C. Back paint components to prevent electrolysis.
- D. Provide steel anchor plates, adapters, and anchor components for installation.
- E. Hot dip galvanized exposed and painted ferrous metal and fastening devices.

## 2.3 FINISHES

- A. Anchors: Galvanize to 1.25 oz/sq yd.
- B. Ferrous Metals - Shop Primed: Pre-treat and clean, spray apply one (1) coat primer and bake.
- C. Enamel: Pre-treat and clean, apply one (1) coat primer and two (2) coats electrostatic baked enamel.
- D. Chrome/Nickel Plating: ASTM B456, Type SC2; satin finish.
- E. Stainless Steel: No. 4 satin luster finish.
- F. Porcelain ceramic: glazed finish, color per Architect selection.

## PART 3 - EXECUTION

### 3.1 EXAMINATION AND PREPARATION

- A. Verify exact location of accessories for installation.
- B. Deliver inserts and rough-in frames to site. Provide templates and rough-in measurements as required.

### 3.2 INSTALLATION

- A. Install fixtures, accessories and items in accordance with manufacturer's instructions.
- B. Install plumb and level, securely and rigidly anchored to substrate. Provide solid wood blocking at all accessories unless accessory is securely attached directly to studs.

### 3.3 SCHEDULE

- A. General: Provide the following accessories in bathrooms.
- B. Manufacturers: Model number and manufacturer's listed below are for the purpose of indicating model features desired. Comparable products by approved manufacturers may also be utilized.
  - 1. Toilet accessories (in public toilet rooms) shall be manufactured by Bobrick, classic series or equivalent, unless noted otherwise.
    - a. Mirror: provide full width surface mounted mirror from top of backsplash to 6'-4" AFF (36" high). Support with continuous metal "J" channel at lower edge and clear plastic mirror clips at sides and across to edge.
    - b. Toilet Paper Holder: # B-4288, one at each water closet.
    - c. Paper towel dispenser: provide one per toilet room; #B-72860
    - d. Sanitary napkin disposal: provide one in each women's toilet room; model #B-270.
    - e. Grab Bars: B6806, Installed into blocking, chrome finish with concealed screws; in locations, sizes and shapes as indicated complete with mounting kits.
      - 1) In wheelchair accessible stalls provide one, 42" grab bar at side wall of toilet, one 36" grab bar at rear wall of toilet and one 18" vertical grab bar at the side.
  - d. Towel Hook: B-983 Vandal Resistant Clothes Hook. Provide one in each shower stall.

END OF SECTION

## **SECTION 122113**

### **WINDOW BLINDS**

#### **PART 1 - GENERAL**

##### **1.1 SUMMARY**

- A. Section includes:
  - 1. Horizontal louver window blinds.

##### **1.2 SUBMITTALS**

- A. Product Data: Provide material specifications, characteristics, and installation directions.
- B. Samples: Submit two (2) samples of each manufacturer's standard colors.

#### **PART 2 - PRODUCTS**

##### **2.1 HORIZONTAL LOUVER BLIND**

- A. Manufacturers:
  - 1. Levelor.
  - 2. Bali "Customizer".
  - 3. Hunter Douglas "Celebrity".
  - 4. Approved equal.
- B. Louver Slats: One (1) inch wide; spring tempered, pre-finished aluminum horizontal slats.
- C. Slat Support: Woven polypropylene, ladder configuration.
- D. Head Rail Housing: Pre-finished, internally fitted with hardware for blind operation.
- E. Cord: Braided nylon.
- F. Control Wand: Plastic, removable type.
- G. Head Support: Overhead head rail housing attachment.
- H. Accessory Hardware: Type recommended by blind manufacturer.
- I. Color: WHITE.
- J. At multiple-mulled windows, provide separate blind for each window unit.



## PART 3 - EXECUTION

### 3.1 EXAMINATION AND PREPARATION

- A. Verify that openings are ready to receive work.

### 3.2 INSTALLATION

- A. Install blinds in accordance with manufacturer's instructions.
- B. Secure in place with concealed fasteners.
- C. Adjust blinds for smooth operation.

### 3.3 SCHEDULE

- A. First Floor:
  - 1. All windows on exterior walls except frosted bathroom windows.
- A. Second Floor:
  - 1. All windows on exterior walls except frosted bathroom windows.

END OF SECTION

## **SECTION 123530**

### **KITCHEN CABINETRY / COUNTERTOPS**

#### **PART 1 - GENERAL**

##### **1.1 SUMMARY**

- A. Section includes:
  - 1. Cabinetry
  - 2. Countertops

##### **1.2 SUBMITTALS**

- A. Shop Drawings
  - 1. Cabinet Shop Drawings: Indicate sizes of units, hardware, mounting systems, all dimensions. Shop drawings shall include plan and elevations of all cabinets.
  - 2. Manufacturer's Information: Provide original printed product data, including cabinet door options, finish options, typical construction details.
- B. Samples
  - 1. Plastic laminate for countertops.
  - 2. Cabinet doors for finish selection
  - 3. Door and drawer hardware.

##### **1.3 DELIVERY STORAGE AND HANDLING**

- A. Protect Cabinets & Countertops during transit, delivery, storage and handling to prevent damage, soiling and deterioration.

#### **PART 2 - PRODUCTS**

##### **2.1 KITCHEN CABINETS**

- A. Cabinets shall meet the following minimum requirements:
  - 1. Cabinets shall be all wood construction solid oak door, ALT. high pressure, plastic laminate or painted tempered Hardboard door.
  - 2. ¾ inch hardwood front frame,
  - 3. ½ inch plywood end panels with birch or equal veneer,
  - 4. 3/8 inch plywood top and bottom panels,
  - 5. ½ inch plywood hanging rails, 1/8 inch plywood back panel,
  - 6. ¾ inch plywood shelving with wood edge band for wall units,
  - 7. ½ inch plywood shelving with wood edge band for base units,
  - 8. ½ inch toe kick same as end panel,

9. ½ inch plywood or better drawer rails,
10. Epoxy coated side mounted drawer guides rated at least 75 pounds load capacity
11. Drawer fronts to be dove tail joined to rails, or four sided construction.
12. Hinges to be of high quality steel, wrap around with self-closing feature.
13. Sink front units shall have a base (bottom) shelf, coped around plumbing.
14. Do not provide vertical mullions between pairs of cabinet doors to allow for full width access.
15. All exposed hardware to be US3 finish, have corrosion resistant finish, and be usable by persons with manual disabilities.
16. Cabinets shall be from an established manufacturer producing a full line of stock size base and wall cabinets with accessories including end pieces, fillers, scribe fins, corner fillers, valances, blind and angle corner cabinets.
17. All exposed surfaces, both inside and outside of cabinet, shall be sealed.
18. Laminate face cabinets of approved quality will be permitted upon approval of the Owner.
19. Products: *Tri Pac* "Ultrawood" Series "Alton Oak", "Gemini" or "Eclipse" Styles, *Tru-Wood* "Shadowwood" Series, or *Crotone* "Verdum" Series; Plantation Oak #648 or Ashley Oak #1212; available through Evans Cabinets (912) 272-2530. Substitutions may only be made with the express written permission of the Owner and Architect.
20. Provide 4" wire pulls (US3 bright brass finish) at all doors and drawers in kitchens, baths and at all other casework.

B. Kitchen Countertop:

1. Post formed, high pressure, plastic laminate countertop with continuous 4 inch back splash and roll front edge. ALT: shop fabricated with metal filler joint between countertop and backsplash.
2. Laminate shall be continuous to under drip edge.
3. Laminate to be "Formica" or equal, laminated to minimum of ¾ inch plywood with 1-1/2 inch front face.
4. All other laminate joints shall be beveled to conceal the edge of the laminate.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

A. General:

1. Discard units of material which are unsound, warped, bowed, twisted, improperly treated, not adequately seasoned or too small to fabricate work with minimum of joints or optimum jointing arrangements, or which are of defective manufacturing with respect to surfaces, sizes or patterns.
2. Install the work plumb, level, true and straight with no distortions. Shim as required using concealed shims. Install to a tolerance of 1/8" in 8'-0" for

plumb and level countertops and with 1/16" maximum offset in flush adjoining 1/8" maximum offsets in revealed adjoining surfaces.

### 3.2 CABINET INSTALLATION

- A. Preparation: Verify that blocking and backings have been installed at appropriate locations for anchorage.
- B. Mount cabinets to firm backing and to each other with concealed screws through wood framing member of cabinet. Install flush, square and smoothly aligned. Seal open joints between backsplash and wall with sealant as previously specified. Adjust hardware and equipment to assure correct operation. Collect all warranties, operating manuals, and installation instructions and provide to client.
- C. Do not begin installation of interior woodwork until potentially damaging construction operations are complete in the installation area.
- D. Install cabinets plumb, level, true and straight with no distortions. Shim as required using concealed shims. Where cabinets abut other finished work, scribe and cut for accurate fit. Provide filler strips, scribe strips and moldings as indicated or required and in same finish to match cabinet face. Make joints neatly with uniform appearance.
- E. Use exterior glue with particleboard in countertops with lay-in sinks.
- F. Cabinets:
  - 1. Install so doors operate smoothly, with edges aligned.
  - 2. Install so drawers operate smoothly.
  - 3. Install all hardware not installed in shop.
  - 4. Anchor tops securely.
  - 5. Install tops level, within 1/8" in 8 feet.
  - 6. Mount cabinets to firm backing and each other with concealed screws through wood framing member of cabinet.
- G. Countertops shall be mechanically fastened to base cabinets. Spline and glue joints in countertops; provide concealed mechanical clamping of joint. Provide cutouts for fixtures and appliances as indicated; drill pilot holes at corners before making cutouts. Smooth cut edges and coat with water proof coating or adhesive. Seal open joint between backsplash and wall.
- H. Complete hardware installation and adjust doors and drawers for proper operation.
- I. Protection: Protect woodwork from damage and maintain design environmental conditions.

### 3.3 ADJUSTMENT, CLEANING, FINISHING AND PROTECTION

- A. Repair damaged and defective finish carpentry work wherever possible to eliminate defects functionally and visually. Where not possible to repair properly, replace woodwork at no cost to Owner. Adjust joinery for uniform appearance.
  - 1. Clean finish carpentry work on exposed and semi-exposed surfaces. Touch-up shop-applied finishes to restore damaged or soiled areas.
  - 2. Sand and fill finish carpentry work as necessary to receive final finishes indicated and/or specified in Division 9.

END OF SECTION

## **SECTION 220500**

### **GENERAL PLUMBING PROVISIONS**

#### **PART 1 - GENERAL**

##### **1.1 REFERENCE TO CONDITIONS OF THE CONTRACT**

- A. The Conditions of the Contract (General, Supplementary and other Conditions) and Division 1 - General Requirements, apply to the work specified in Division 22. Unless the specifications contain statements which are more definitive or more restrictive than those contained in the Conditions of the Contract, the specifications shall not be interpreted as waiving or overruling any requirements expressed in the Conditions of the Contract.

##### **1.2 SCOPE OF WORK**

- A. The scope of the work included under Division 22 of the specifications shall include complete mechanical systems as shown in the Contract Documents and specified herein. Any work reasonably inferable or required to result in a complete installation or the intended operation and performance of the systems, shall be included in the Base Bid except where there is specific reference to exclusion and incorporation in other quotations.

##### **1.3 INTENT OF DRAWINGS**

- A. Provide a complete mechanical system for the proposed project. The mechanical system provided shall conform to the details stated in the specifications and shown on the drawings. Items or work not shown or specified, but required for a complete mechanical system, shall be provided and shall conform with accepted trade practices. The drawings and specifications are presented to define specific system requirements and serve to expand on the primary contract requirements of providing a complete mechanical system. The drawings are diagrammatic and indicate only the general arrangement of the items comprising the several systems included in the mechanical work.
- B. Do not scale the drawings. Because of the scale of the drawings, it is not possible to indicate offsets, fittings, valves, or similar items which may be required to make a complete operating system. Carefully investigate conditions affecting work and install work in such a manner that interferences between pipes, conduit, ducts, equipment, and architectural and structural features shall be avoided and shall provide items that may be required to meet the conditions at the building, without additional cost to the Owner.
- C. Bidders shall have sufficient expertise in this type of construction to realize the extent of the work required.
- D. It should, therefore, be obvious to any prudent firm with experience in this field that these documents may not explicitly disclose final details; however, the firms offering proposals are represented to possess the expertise necessary to include necessary appointments.

##### **1.4 DEFINITIONS**

- A. Specific terminology, as used herein, shall have the following meanings:
  - 1. "Furnish"...Supply and deliver to project site, ready for unloading, unpacking, assembly, installation, and similar subsequent requirements.

2. "Install"...Operations at project site, including unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar requirements.
3. "Provide"...Furnish and install, complete and ready for intended use.
4. "Piping"...Pipe, fittings, flanges, valves, controls, hangers, traps, drains, insulation, vents and other items customarily required in connection with the transfer of fluids.
5. "Concealed"...Embedded in masonry or other construction, installed behind wall furring, within double partitions or hung ceilings, in crawl spaces or shafts.
6. "Exposed"...Not concealed.
7. "Conditioned"...Spaces directly provided with heating and cooling.
8. "Unconditioned"...Spaces without heating or cooling including ceiling plenums.
9. "Indoors"...Located inside the exterior walls and roof of the building.
10. "Outdoors"...Located outside the exterior walls and roof of the building.

B. Reference to the following codes and standards shall mean:

<u>Reference</u>	<u>Definition</u>
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CGA	Compressed Gas Association, Inc.
ASTM	American Society for Testing Materials
NFPA	National Fire Protection Association
UL	Underwriters Laboratories, Inc.
NEMA	National Electrical Manufacturers Association
USAS	United States of America Standards Institute
ANSI	American National Standards Institute
AWWA	American Water Works Association
FS	Federal Specification, US Government
CS	Commercial Standards issued by US Department of Commerce
MSS	Manufacturers Standardization Society of the Valve and Fitting Industry
AGA	American Gas Association
ADA	Americans with Disabilities Act

C. References to codes, standards, manufacturer's information, etc. are the latest publication in effect during the bid period.

## 1.5 GENERAL STANDARDS OF MATERIALS

- A. Equipment and materials, unless specifically indicated otherwise, shall be new and of first quality, produced by manufacturers who have been regularly engaged in the manufacture of these products for a period of not less than five years.
- B. Equipment of one type shall be the products of one manufacturer; similar items of the same classification shall be identical, including equipment, assemblies, parts and components.
- C. Materials furnished shall be determined safe by a nationally recognized testing organization, such as Underwriters' Laboratories, Inc., or Factory Mutual Engineering Corporation, and materials shall be labeled, certified or listed by such organizations.

- D. With respect to custom made equipment or related installations which are constructed specially for this project, the manufacturer shall certify the safety of same on the basis of test data. The Owner shall be furnished copies of such certificates.
- E. All products provided shall meet flame spread and smoke spread ratings of 25/50.

#### 1.6 PRODUCTS AND SUBSTITUTIONS

- A. Where several manufacturers' products are specified, the bid shall be based upon the specified products only. Proposed substitutions will be considered if received 5 days before the bid date and in accordance with Division 1 requirements.
- B. Note that where only one manufacturer's product is specified, the associated systems have been designed on the basis of that product. Where several manufacturer's products are specified, the associated systems have been designed on the basis of the first-named manufacturer's product. When products other than those used as the basis of design are provided, pay additional costs related to modifications to the systems and/or structure required by the use of that product.
- C. It is the intent of these specifications that service organizations such as balancing agencies follow the above substitution procedures.

#### 1.7 CODES, PERMITS AND INSPECTIONS

- A. Materials furnished and work installed shall comply with the National Standard Plumbing Code, International Mechanical Code, with the International Energy Conservation Code, with the National Fire Codes of the National Fire Protection Association, with the requirements of the local utility companies, and with the requirements of governmental departments or authorities having jurisdiction. Materials and equipment furnished for the electrical portion of the mechanical systems shall bear the approval label of or shall be listed by the Underwriters' Laboratories, Inc. Electrical work shall comply with the National Electrical Code.
- B. Provide labor, materials, services, apparatus and drawings required to comply with applicable laws, ordinances, rules and regulations, whether or not shown on the drawings and/or specified.
- C. Provide labor, materials, services and apparatus required for the performance and pressure tests specified hereinafter. Final tests shall be conducted in the presence of the Architect (Engineer) and inspectors of authorities having jurisdiction, who shall be notified, in writing, at least 48 hours in advance of same. Ensure that the work shall stand the final test prior to giving the notification. Should the work fail the final test, necessary corrections shall be made and the work shall be re-submitted for testing and inspection. The cost of the Architect's additional time, travel expenses, and other applicable expenses due to the re-testing shall be included.
- D. Obtain and pay for required permits.

#### 1.8 GUARANTEES AND CERTIFICATES

- A. Where materials or equipment are specified to comply with requirements of the Underwriters' Laboratory, Inc., the American Refrigeration Institute, the American Society of Mechanical Engineers, or similar technical groups or societies having jurisdiction over the type and design of particular mechanical or electrical equipment specified herein, proof of such compliance shall be submitted. The label or listing of the specified agency shall be acceptable evidence. In lieu of a label or listing, a written certificate may be submitted from an approved, nationally recognized testing



organization equipped to perform such services, stating that the items have been tested and conform to the requirements and testing methods of the specified agency. Where equipment is specified to conform to requirements of the ASME Boiler and Pressure Vessel Code, the design, fabrication and complete installation shall conform to that code.

1. Certification shall be submitted attesting to the fact that the specified performance criteria are met by items of equipment.
2. Work shall be guaranteed to be free from leaks or defects. Any defective equipment, materials or workmanship, including damage to the work provided under other divisions of this contract resulting from same, shall be replaced or repaired at no extra cost to the Owner for the duration of the stipulated guarantee periods.
3. Unless specifically indicated otherwise, the duration of the guarantee period shall be one (1) year following the date of final acceptance by the Owner. Owner acceptance will begin with actual occupancy of the areas served by this equipment. Temporary operation of the equipment for temporary conditioning, testing, etc., prior to occupancy will not be considered part of the warranty period.

#### 1.9 QUIET OPERATION AND VIBRATION CONTROL

- A. Equipment and associated items shall operate under conditions of load without sound or vibration deemed objectionable by the Architect (Engineer). In the case of moving equipment, sound or vibration noticeable outside of the room in which it is installed, or annoyingly noticeable within the room in which it is installed, shall be deemed objectionable. Sound or vibration deemed objectionable shall be corrected in an approved manner at no extra cost to the Owner. Vibration control shall be provided by means of approved vibration isolators and installed in accordance with the isolator manufacturer's recommendations.
- B. The sound pressure levels around mechanical and electrical equipment (fans, pumps, motors, etc.) in equipment spaces shall not exceed 85 dBA at any point three (3) feet from the equipment, with all equipment in the room operating. The sound criteria applies to the complete range of each piece of equipment.

#### 1.10 COORDINATION

- A. Coordinate and furnish in writing to the Architect (Engineer) any information necessary to permit the work to be installed satisfactorily and with the least possible interference or delay.
- B. Devices and appurtenances which are to be installed in finished areas shall be coordinated with the Architect for final approval as it relates to location, finish, materials, color and texture.
- C. When work is installed without proper coordination, changes to this work deemed necessary by the Architect shall be made to correct the conditions without extra cost to the Owner.

#### 1.11 ACCESSIBILITY

- A. Coordinate to ensure the sufficiency of the size of shafts and chases, and the adequacy of clearances in hung ceilings and other areas required for the proper installation of this work.

- B. Locate equipment which must be serviced, operated or maintained in fully accessible positions. Locations in ceilings requiring access shall be coordinated with, but not limited to, lights, curtain tracks, speakers, and medical gas tracks. Equipment requiring access shall include, but is not necessarily limited to, valves, traps, clean-outs, motors, fire dampers, controllers, switchgear and drain points.
- C. Provide drawings for coordination, as required, showing exact locations of access doors for each concealed valve, control, damper, or other device concealed behind finished construction and requiring service. Equipment (valves, RTC) below floor slab or finished grade shall be considered as finished construction. Access doors in finished construction shall be furnished as specified in this section. Locations of access doors in finished construction shall be submitted in sufficient time to be installed in the normal course of the work.

#### 1.12 ACCESS DOORS

- A. Manufacturers: Subject to compliance with requirements, furnish access doors by one of the following:
  - 1. Bar-Co., Inc.
  - 2. J. L. Industries
  - 3. Karp Associates, Inc.
  - 4. Nystrom, Inc.
- B. Materials and Fabrication:
  - 1. General: Furnish each access door assembly manufactured as an integral unit, complete with all parts and ready for installation.
  - 2. Steel Access Doors and Frames: Fabricate units of continuous welded steel construction, unless otherwise indicated. Grind welds smooth and flush with adjacent surfaces. Furnish attachment devices and fasteners of type required to secure access panels to types of support shown.
  - 3. Frames: Fabricate from 16-gauge steel.
    - a. Fabricate frame with exposed flange nominal 1 inch wide around perimeter of frame for units installed in the following construction:
      - 1) Exposed Masonry
    - b. For gypsum drywall or veneer gypsum plaster, furnish perforated frames with drywall bead.
    - c. For installation in masonry construction, furnish frames with adjustable metal masonry anchors.
    - d. For full-bed plaster applications, furnish frames with galvanized expanded metal lath and exposed casing bead, welded to perimeter of frame.
  - 4. Flush Panel Doors: Fabricate from not less than 14-gauge sheet steel, with concealed spring hinges or concealed continuous piano hinge set to open 175°. Finish with manufacturer's factory-applied prime paint.
    - a. For fire-rated units, provide manufacturer's standard insulated flush panel/doors, with continuous piano hinge and self-closing mechanism.

5. Locking Devices: Furnish flush, screwdriver-operated cam locks of number required to hold door in flush, smooth plane when closed.

- C. Furnish access doors under this division for installation by General Contractor. Coordinate during bidding phase with General Contractor.

#### 1.13 ELECTRICAL CONNECTIONS

- A. Regardless of voltage, provide temperature control wiring, interlock wiring, and equipment control wiring for the equipment provided under this division of the specifications.
- B. Furnish electrical disconnect switches, starters and combination starter disconnects required for equipment provided under this division of the specifications.
- C. Power wiring not used for control functions, complete from power source to motor or equipment junction box, including power wiring through starters, shall be provided under Division 16.
- D. Coordinate to ensure that electrical devices furnished or provided are compatible with the electrical systems used.
- E. Furnish circuit breakers rated for motor protection (for installation under Division 16) for equipment purchased under this division of the specification.

#### 1.14 SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES

- A. Shop drawings, product data, and samples shall be submitted in accordance with the provisions of Division 1 - General Requirements.
- B. The following shall be submitted by the Contractor for review by the Architect:
  1. Scale shop drawings indicating insert and sleeve locations.
  2. Scale shop drawings showing piping and duct runs with sizing indicated.
  3. Product data, factory assembly shop drawings, and field installation shop drawings as required for a complete explanation and description of items of equipment, including appurtenances and accessories. Product data for pumps, fans and similar equipment shall include performance curves illustrating equipment performance characteristics under the specified range of operating conditions.
  4. Samples of finishes and trim exposed to view, such as cleanout plates, fixture trim, escutcheon plates and similar items.
  5. Product data for plumbing fixtures, trim, hangers, and miscellaneous plumbing materials.
  6. Product data for piping inserts, rods, hangers, anchors, guides and trapezes.
  7. Shop drawings locating piping anchor and guide points and expansion joints or loops.
  8. Shop drawings locating access doors in sheet metal work.

#### 1.15 OPERATING AND MAINTENANCE INSTRUCTIONS

- A. After final tests and adjustments have been completed, furnish the services of qualified personnel to fully instruct representatives of the Owner in the operation and maintenance procedures for equipment installed including cooling plant, heating plant,

air systems, plumbing systems. Operation and maintenance instructions for major items of equipment shall be directly supervised by the equipment manufacturer's representative. Supply qualified personnel to operate equipment for sufficient length of time as required to meet governing authorities' operation and performance tests and as required to assure that the Owner's representatives are properly qualified to take over operation and maintenance procedures. Minimum instruction period shall be 30 man hours. The instruction period shall be broken into segments at the discretion of the Owner.

1. Notify the Architect, the Owner's representative and equipment manufacturers' representatives, by letter, as to the time and date of operating and maintenance instruction periods approved by the Owner at least one (1) week prior to conducting same.
2. Forward to the Architect the signatures of all those present for the instruction periods.

B. Furnish three (3) copied of recommended equipment operation and maintenance procedures manuals as specified herein, assembled and bound together in 8-1/2 x 11 inch three-ring binders. The binders shall be submitted to the Architect in accordance with procedures established for shop drawing submittals in Division 1 - General Requirements.

1. The operation and maintenance procedures manuals shall include the following:
  - a. Project title
  - b. Architect's name and address
  - c. Date submitted
  - d. Contractor and subcontractors' name and address
  - e. Index (in alphabetical order, with page numbers)
  - f. General description of each system
  - g. Parts list, identifying the various parts of equipment for repair and replacement purposes.
  - h. List of spares recommended for normal service requirements.
  - i. Edited operating instructions outlining step-by-step procedures required for system start-up and operation. The instructions shall include the manufacturer's name, model number, service manual, and brief description of each piece of equipment and its basic operating features.
  - j. Maintenance instructions describing routine maintenance and lubrication procedures and schedules, and simplified diagrams which illustrate the systems as installed. Instructions as described above shall be tailored for each specific system.
  - k. Wiring and control diagrams for each piece of equipment, showing "as installed" conditions.
  - l. Performance curves for pumps, fans and similar equipment.
  - m. One (1) reviewed copy of each shop drawing submitted.

#### 1.16 SINGULAR NUMBER

- A. References made to any item in the singular number shall apply equally to as many identical items that the work may require.

#### 1.17 PROTECTION OF SERVICES

- A. Repair, replace and maintain in service any new or existing utilities, facilities or services (underground, overground, interior or exterior) damaged, broken or otherwise rendered inoperative during the course of construction. The method used in repairing, replacing or maintaining the services shall be approved by the Owner and Architect.

#### 1.18 PROTECTION OF FLOORS

- A. Protect existing flooring from damage during the construction period. Provide plywood or similar material under equipment or materials stored on floors, and in areas where construction may damage the floor surfaces. Replace floor surfaces (including sealer) damaged during the construction.

#### 1.19 SPECIAL TOOLS

- A. Provide the Owner's representative with two (2) sets of special tools required for operation and maintenance of equipment provided.

#### 1.20 REVIEW BY ARCHITECT/ENGINEER

- A. Notify the Architect/Engineer at least 48 hours in advance of the date and time of tests specified to be witnessed by the Engineer. The Architect/Engineer reserves the right to demand repetition of any testing where he is unable to attend due to insufficient notice without additional cost to the owner.

#### 1.21 PRE-BID SITE VISIT

- A. Bidders shall visit the site and become completely familiar with existing conditions prior to submitting their bid. No extra charges shall be allowed as a result of existing conditions.

### PART 2 - PRODUCTS

#### 2.1 MATERIALS AND WORKMANSHIP

- A. Equipment shall be so built and installed as to deliver its full rated capacity at the efficiency for which it was designed. Equipment shall meet the detailed requirements indicated, and shall be suitable for the installation shown.
- B. Where two or more units of the same class of equipment are furnished in same Section of Specifications, provide each from the same manufacturer. Furnish equipment and materials new and free from defects of size, make, type and quality herein specified, or as reviewed. Work shall be installed in a neat and workmanlike manner.
- C. Capacities, dimensions, or sizes specified or indicated are minimum, unless otherwise stated. Tolerances used in rating or testing standards specified shall not be allowed in determining capacities of equipment.
- D. Materials shall be listed by the Underwriters' Laboratories, Inc. where applicable and shall be manufactured in accordance with applicable standards established by ANSI, NEMA, ASTM, and IEEE.

- E. Any products judged not in accordance with the Specifications either before or after installation shall be rejected.
- F. Where products are specified with no reference to a particular manufacturer's product, the product used shall meet or exceed industry construction and testing procedure standards applicable to the product, for life expectancy, performance and safety.
- G. Where electrical products are a fabricated assembly, the fabricator shall assume responsibility for correct operation of the entire assembly and of its individual components.
- H. Tools: Provide special tools for proper operation and maintenance of the equipment.

## 2.2 ANCHOR BOLTS

- A. Provide and set in place, at the time of pouring of concrete foundations, necessary anchor bolts as required for the equipment called for under these specifications. Anchor bolts shall be of the hook type, of proper size and length to suit the equipment. Anchor bolts shall be set in pipe sleeves of approximately twice the bolt diameter and one half the embedded length of the bolt. Assume full responsibility for proper emplacement of the bolts.

## 2.3 INSERTS

- A. Provide inserts of an approved metallic type for hangers. Where two or more parallel conduits are installed, continuous inserts may be used. Where required to distribute the load on the inserts, a piece of reinforcing steel of sufficient length shall be passed through the insert.

## 2.4 SLEEVES

- A. Provide sleeves in all roofs, floors, and any fire-rated walls. Each sleeve shall extend through its respective floor, wall or partition and shall be cut flush with each surface unless otherwise required.
- B. Sleeves in bearing and masonry walls, floors and partitions shall be standard weight steel pipe finished with smooth edges. For other than masonry partitions, through suspended ceilings, and for concealed vertical piping, sleeves shall be No. 22 USG galvanized iron.
- C. Sleeves shall be properly installed and securely cemented in place.
- D. Floor sleeves shall extend 1 inch above the finished floor, unless otherwise noted. Space between floor sleeves and passing conduit shall be caulked with graphite packing and waterproof caulking compound.
- E. Sleeves through exterior walls below grade shall have the space between conduit and sleeve caulked watertight using an approved method.

## 2.5 FIREPROOFING

- A. Where sleeves or other penetrations pierce floors or walls having specific fire ratings, the space between the sleeve and passing conduit shall be fireproofed using 3M Series 7900 Penetration Fire Stop putty. Where a cable tray passes through fire-rated walls, use seal bags as manufactured by International Protection Coatings Company. Installation method shall be per manufacturer's recommendations and approved by the Architect/Engineer.

## 2.6 MISCELLANEOUS METAL AND STRUCTURAL STEEL

- A. Scope of Work: Furnish labor, materials, equipment and services necessary for the installation of miscellaneous metal and structural steel work required to complete this contract. Erect structural steel required for the proper support of equipment required under this contract.
- B. Supports, brackets, and clamps and other items specified herein shall be installed in strict accordance with the best practices and recognized code.
- C. Materials: Structural steel members required under this part shall conform to ASTM Standard Specification A-7. Other materials shall be as specified hereinafter.
- D. Priming: steel and iron work shall be primed with Rust-Oleum 769 or approved equivalent. Before priming, metal shall be thoroughly cleaned free from scale, rust and dirt.
- E. Anchors: Provide anchors, bolts, screws, dowels and connecting members, and do cutting and fitting necessary to secure the work to adjoining construction. Build in connecting members to masonry, concrete and structural steel as the work progresses.
- F. Supports and Brackets: shall be neatly constructed to structural shapes to adequately support the equipment intended. Supports must be approved prior to installation. Attention is directed to the proper rigid support required for conduit. Field conditions shall regulate the type of support required.

## 2.7 VIBRATION ISOLATION MOUNTS

- A. Provide vibration isolation mounts for all substations, power centers, transformers, etc. All vibration isolation mounts shall be Amber-Booth spring type applicable for the size and weight of the equipment.

## 2.8 GRADING, FERTILIZING, AND SEEDING

- A. Provide labor, materials, equipment, and services required to strip and store topsoil, replace topsoil, and rough and finish grade and fertilize and seed areas disturbed beyond the work area of the General Contract. Topsoil must be stored where directed on the site.

## 2.9 BITUMINOUS PAVING

- A. Provide labor, materials, equipment, and services necessary to repair pavements disturbed under the Contract.
- B. Materials, methods, and workmanship shall conform with the requirements of the PA Department of Highways, as published in its specifications Form 408, as amended to date.
- C. All patching of existing areas shall match existing materials.

## 2.10 MOTORS

- A. Motors shall be built in accordance with the latest standards of NEMA and as specified. Motors shall be tested in accordance with ASA C50 and conform thereto with respect to insulation resistance and dielectric strength.
- B. Each motor shall be provided with conduit terminal box and adequate starting and protective equipment as specified or required. The capacity shall be sufficient to operate associated driven devices under conditions of operation and load and without overload, and shall be at least the horsepower indicated or specified. Each motor type shall be for quiet operation.

- C. Motor starting equipment must be selected so that starting currents or transients do not have an adverse effect on lighting or other electrical equipment. No open transition wye-delta starting of motors shall be permitted.

## PART 3 - EXECUTION

### 3.1 GENERAL

- A. Provide information to the General Contractor for any chases or openings required under this Contract. No cutting shall be done which may affect the building structurally or architecturally without the prior approval of the Architect. Damaged construction shall be restored to its original conditions and finished to match the surrounding work. Refer to "Supplementary General Conditions" for the disposition of Cutting and Patching.
- B. Grades, elevations, and dimensions shown on the drawings are approximately correct; however, field check and otherwise verify such data at the site before proceeding with the work. Make necessary survey equipment available at all times and make use of such equipment wherever necessary to properly install equipment.
- C. The Contractor shall be entirely responsible for apparatus, equipment, and appurtenances furnished by him or his subcontractors in connection with the work and special care shall be taken to protect parts thereof in such manner as may be necessary or as may be directed. Protection shall include covers, crating, sheds or other means to prevent dirt, grit, plaster or other foreign substances from entering the working parts of machinery or equipment. Special care shall be taken to keep open ends of pipes closed while in storage and during installation. Where equipment must be stored outside the building, it shall be totally covered and secured with heavy weatherproofing tarps and kept dry at all times. Where equipment has been subjected to moisture, it shall be removed from the site and replaced with new equipment. Protect open excavating until covered over.
- D. Due to the schematic nature and small scale of the electrical drawings, it is not possible to indicate exact locations, offsets, fittings, access panels, pull boxes, and miscellaneous parts which may be required to form a complete system. The drawings are generally indicative of the work to be installed. Arrange work accordingly furnishing necessary parts and equipment as may be required to meet the various conditions and to provide a complete circuit from end use device to circuit protective device in panel.
- E. The Contractor shall include in his bid price, the cost to furnish and install two additional lavatories, including all necessary sanitary and domestic water piping.
- F. Within thirty (30) days after acceptance of bids, submit to the Architect for approval, a complete list of equipment and materials to be furnished under this contract, giving names and addresses of manufacturers and material they intend to furnish. This source of supply shall be listed on forms available from the Architect.



### 3.2 CLEARANCES

- A. Take caution when on routing conduit and location of equipment. In many cases, clearances in ceiling plenums is limited due to ductwork and other mechanical lines and systems and steel. The Contractor shall be responsible for routing around mechanical equipment and ducts in order that everything can remain concealed in finished areas.

### 3.3 CUTTING AND PATCHING

- A. Provide cutting and patching necessary to install the work specified herein. Patching shall match adjacent surfaces. Refer to Section 01045, Cutting and Patching, for specific direction.
- B. No structural members shall be cut without prior approval of the Architect, and such cutting shall be done in a manner directed by the Architect.
- C. Provide ceiling removal and replacement where work above ceilings is required. Replace ceiling components damaged in the process.
- D. Provide patching where electrical devices are removed from walls, ceilings or floors as required under demolition.

### 3.4 PAINTING

- A. Finished painting shall be performed by others except for standard factory finishes.
- B. Electrical motors, pump casings, and other similar items shall be provided with three coats of machinery enamel at the factory, and shall be carefully cleaned, rubbed down, and oiled after installation.

### 3.5 LOCATIONS

- A. Apply for detailed and specific information regarding the location of equipment as the final location may differ from that indicated on the drawings. Outlets, equipment or wiring improperly placed because of failure to obtain this information shall be relocated and re-installed without additional expense to the Owner. Determine the actual direction of door swings, so that local switches and other controls shall be installed at the lockside of doors, unless otherwise noted. Improperly located switches shall be relocated without additional expense to the Owner.
- B. The design shall be subject to such revisions as may be necessary to overcome building obstructions. No changes shall be made in location of outlets or equipment without written consent of the Architect and Owner.
- C. Unless otherwise mentioned or indicated, mounting heights of outlets are shown on the drawings or in the specification. Dimensions given shall be considered to be from center of outlet to finished floor.
- D. Properly rough for the electrical conduit and equipment under this contract and modify as required for coordination during the construction period.

### 3.6 DUST, DIRT AND NOISE

- A. Carry out new work and make changes, relocations, and installations with a minimum of noise. Site areas and new equipment, floors and walls, shall be adequately protected from dust and dirt caused by the work. Protection shall include suitable temporary barriers or coverings. The exterior and interior premises of each building

shall be kept clean as possible during construction. Damages to surfaces or equipment as a result of negligence shall be replaced or corrected as required.

### 3.7 RECORD DRAWINGS

- A. During the construction period, maintain in good order a complete set of blue line electrical contract drawings. Record the actual electrical installation as the work progresses. Include changes to the contract and to equipment sizes and types. Keep these drawings available at the site at all times for inspection.
- B. Take proper caution against the use of superseded drawings. Check such copies and mark "void." Where drawings have been corrected by memorandum, assume the responsibility for marking all drawings so affected with the changes; such marked drawings shall remain in use until revised drawings are issued.
- C. At the conclusion of the work, obtain a set of sepias from the Architect. Incorporate "as built" data in a clearly legible manner. Return such marked prints or sepias within 30 days to the Architect.
- D. At the conclusion of the work, provide to the Architect a complete set of drawings which indicate precisely how the electrical single line and riser diagram equipment has been installed. Return such reproducible drawings within 30 days to the Architect.

### 3.8 EQUIPMENT, FOUNDATIONS, SUPPORTS, PIERS AND ATTACHMENTS

- A. Provide necessary foundations, supports, pads, bases and piers required for equipment specified in this division; submit drawings in accordance with Shop Drawing Submittal requirements prior to the purchase, fabrication or construction of same.
- B. Provide concrete pads for base-mounted transformers and rotating equipment, and for floor-mounted equipment located in equipment rooms and as indicated on the drawings. Pads shall be extended 6 inches beyond matching base in all directions with top edge chamfered. Inset 6 inch steel dowel rods into floors to anchor pads.
- C. Construction of foundations, supports, pads, bases and piers, where mounted on the floor, shall be of the same materials and same quality of finish as the adjacent and surrounding floor material.
- D. Equipment shall be securely attached to the building structure in an approved manner. Attachments shall be of a strong and durable nature and any attachments that are, in the opinion of the Architect, not strong and durable shall be replaced as directed.

### 3.9 SCAFFOLDING

- A. Furnish and erect scaffolding and ladders required in the installation of wiring, equipment and fixtures.

END OF SECTION

## SECTION 220517

### PLUMBING SLEEVES, SEALS, AND ESCUTCHEONS

#### PART 1 - GENERAL

##### 1.1 APPLICABLE PUBLICATIONS

A. The publications listed below form a part of this specification.

B. Federal Specifications (Fed. Spec.):

L-C-53OC ..... Coating, Pipe, Thermoplastic Resin  
L-T-1512A ..... Tape, Pressure Sensitive Adhesive, Pipe Wrapping  
O-C-114B(2) ..... Calcium Hypochlorite, Technical  
O-S-602E ..... Sodium Hypochlorite Solution  
BB-C-120C ..... Chlorine, Technical, Liquid  
WW-V-35C ..... Valve Ball Brass or Bronze  
WW-V-1967 ..... Valve, Butterfly (Threaded Ends And Solder Ends)

C. American National Standards Institute (ANSI):

American Society of Mechanical Engineers (ASME): (Copyrighted Society)  
A11.21.1M-80 ..... Floor Drains ANSI/ASME  
B16.3-85 ..... Malleable Iron Threaded Fittings ANSI/ASME  
B16.4-85 ..... Cast Iron Threaded Fittings Classes 125 and 250 ANSI/ASME  
B16.9-86 ..... Factory-Made Wrought Steel Buttwelding Fittings ANSI/ASME  
B16.11-80 ..... Forged Steel Fittings, Socket-Welding and Threaded ANSI/ASME  
B16.12-83 ..... Cast Iron Threaded Drainage Fittings ANSI/ASME  
B16.15-85 ..... Cast Bronze Threaded Fittings ANSI/ASME  
B16.18-84 ..... Cast Copper Alloy Solder-Joint Pressure Fittings ANSI/ASME  
B16.22-89 ..... Wrought Copper and Copper Alloy Solder Joint Pressure Fittings  
ANSI/ASME  
B31.1 ..... Pipe Welding  
B31.8-86 ..... Gas Transmission and Distribution Piping Systems ANSI/ASME  
B40.1-85 ..... Gauges-Pressure Indicating Dial Type-Elastic Element  
ANSI/ASME

D. American Society for Testing and Materials (ASTM):

A47-84 ..... Ferritic Malleable Iron Castings Revision 1989  
A53-89 ..... Pipe, Steel, Black And Hot-Dipped, Zinc-coated Revision A  
Welded and Seamless  
A74-87 ..... Cast Iron Soil Pipe and Fittings  
A183-83 ..... Carbon Steel Track Bolts and Nuts  
A312-89 ..... Seamless and Welded Austenitic Stainless Steel Pipe  
A536-84 ..... Ductile Iron Castings  
A733-89 ..... Welded and Seamless Carbon Steel and Austenitic Stainless  
Steel Pipe Nipples  
B32-89 ..... Solder Metal  
B61-86 ..... Steam or Bronze Castings  
B62-86 ..... Composition Bronze or Ounce Metal Castings  
B75-86 ..... Seamless Copper Tube  
B88-89 ..... Seamless Copper Water Tube  
B152 ..... Copper Sheet

- B-819.....Medical Gas Seamless Copper Tube
- B306-88.....Copper Drainage Tube (DWV)
- B584-89.....Copper Alloy Sand Castings for General Applications Revision A
- B687-88.....Brass, Copper, and Chromium-Plated Pipe Nipples
- C564-88 .....Rubber Gaskets for Cast Iron Soil Pipe and Fittings
- D2000-86 .....Rubber Products in Automotive Applications
- D2146-82 .....Propylene Plastic Molding and Extrusion Materials
- D2447-89 .....Polyethylene (PE) Plastic Pipe, Schedule 40 and 80, Based on  
Outside Diameter
- D2564-89 .....Solvent Cements for Poly (Vinyl Chloride) (PVC) Pipe Plastic Pipe  
and Fittings
- D2665-89 .....Poly (Vinyl Chloride) (PVC) Plastic Drain, Waste, and Revision A  
Vent Pipe and Fittings
- D4101-82 .....Propylene Plastic Injection and Extrusion Materials
- E. American Water Works Association (AWWA):
  - C151-86 .....Ductile-Iron Pipe, Centrifugally Cast in Metal Molds or Sand-Lined  
Molds, for Water or Other Liquids
  - C203-86 .....Coal-Tar Protective Coatings and Linings for Steel Water  
Pipelines - Enamel and Tape - Hot Applied
  - C651-86 .....Disinfecting Water Mains
  - C701-88 .....Cold Water Meters-Turbine Type, for Customer Service
- F. National Fire Protection Association (NFPA):
  - 54-88.....National Fuel Gas Code
- G. American Welding Society (AWS):
  - A5.8-89.....Filler Metals for Brazing
- H. National Association of Plumbing - Heating - Cooling Contractors (PHCC):
  - National Standard Plumbing Code - 1990
- I. Cast Iron Soil Pipe Institute (CISPI):
  - 301-85.....Hubless Cast Iron Soil and Fittings
- J. International Association of Plumbing and Mechanical Officials (IAPMO):
  - Uniform Plumbing Code - 1988
  - IS6-82.....Installation Standard
- K. Manufacturers Standardization Society of the Valve and Fittings Industry, Inc. (MSS):
  - SP-70-84 .....Cast Iron Gate Valves, Flanged and Threaded Ends.
- L. American Society of Sanitary Engineers (ASSE):
  - 1003 .....Water Pressure Reducing Valves
  - 1010 .....Water Hammer Arresters
  - 1001-70 .....Pipe Applied Atmospheric Type Vacuum Breakers
  - 1013-88 .....Reduced Pressure Principle Backflow Preventers
  - 1015-88 .....Double Check Backflow Prevention Assembly
  - 1020-81 .....Vacuum Breakers, Anti-Siphon, Pressure Type

- M. Factory Mutual (FM):  
 1680-89 ..... Coupling Used in Hubless Cast Iron Systems for Drains, Waste  
 and Vent Systems.

## PART 2 - PRODUCTS

### 2.1 PIPE SLEEVES AND ESCUTCHEON PLATES

- A. Provide sleeves for piping passing through roofs, floors, ceilings, walls, partitions, air handling equipment, structural members, and other building parts.
- B. Sealant shall be equivalent to Dow Corning 795 Silicone Sealant for general purpose use and Dow Corning 786 Mildew Resistant Silicone Sealant for Kitchen, Food Preparation, and Dining areas. Prime sleeves in accordance with manufacturer's recommendations.
- C. Sealant in one-hour and two-hour walls and one-hour and two-hour floors shall be equivalent to Dow Corning Fire Stop System Sealants and Foams. Sealants and foams shall be UL listed and installed in accordance with manufacturer's recommendations.
- D. Schedule of Sleeve Materials

Sleeve Type	Sleeve Material
1	18 gauge galvanized steel
2	Std. weight galvanized steel pipe
3	Std. weight galvanized steel pipe with a continuously welded water stop of 1/4 inch steel plate extending a minimum of 2 inches from the outside of the sleeve. (F&S Mfg. Co. Figure 204 or approved equal.)
4	Cast iron pipe sleeve with center flange. (James B. Clow & Sons No. F-1430 & F-1435, or approved equal.)
5	Std. weight galvanized steel pipe with flashing clamp device welded to pipe sleeve or watertight sleeves. (Josam 1870-A2 with oakum and lead caulking as required, or approved equal.)
6	Metal deck and wall sleeves.

### E. Escutcheon Plates

#### 1. Schedule of Escutcheon Plate Materials

<u>Location</u>	<u>Escutcheon Plate Material</u>
Finished spaces	Anodized aluminum or chrome-plated brass
Unfinished spaces	Plain brass, cast iron or aluminum

### 2.2 PIPE FLASHING FITTINGS

- A. Pipes passing through roof construction shall be provided with pipe portal type curb.

## PART 3 - EXECUTION

### 3.1 GENERAL

### 3.2 PIPE SLEEVES

- A. Grout sleeves to building structure for watertight fit.
- B. Schedule of Sleeve Lengths

Location	Sleeve Length
Floors	Equal to depth of floor construction and at least 1 inch above finished floor construction. In waterproof floor construction, sleeves shall extend a minimum of 2 inches above finished floor construction.
Roofs	Equal to depth of roof construction including insulation.
Walls and Partitions	Equal to depth of construction and terminated flush with finished surfaces.

- C. Schedule of Sleeve Caulking and Packing

Caulking/ Packing Type	Caulking/Packing Requirements
A	Space between pipe and sleeve shall be packed with oakum and caulked watertight with lead.
B	Space between pipe or pipe covering and sleeve shall be caulked with an incombustible permanently plastic waterproof, non-staining compound leaving a smooth, finished appearance.
C	Vermينproofing - space between pipe and sleeve shall be packed with insulation consisting of sections of foam glass equal in length to length of sleeve, caulked at both ends with sealant according to manufacturer's recommendations. Vermينproofing for pipes with insulation shall be minimum 1 inch thick sections of foam glass as long as sleeves with space between foam glass and sleeve packed with industrial felt or fiberglass caulked at both ends with sealant according to manufacturer's recommendations.

D. Schedule of Sleeve Applications

Location	Sleeve Type Thru Fire Rated Construction	Sleeve Type Thru Non- Fire Rated Construction	Sleeve Caulking and Packing Type
Membrane water-proof floor, roof and wall construction	5	5	C
Non-membrane waterproof floor, roof and wall construction where flashing is required	5	5	C
Interior walls, partitions, and floors	2	1 or 2	C
Exterior walls	---	3 or 4	C
Cellular metal deck floors	2	6	B
Precast concrete floor with poured concrete topping	--	1	B
<b>(NOTE:</b> sleeves with flat flanges or guides which rest on top of precast slab required)			

3.3 PIPE FLASHING FITTINGS

- A. Pipe passing through roof construction shall be arranged to provide a minimum of 12 inches clearance from walls or other obstructions so as to permit proper flashing.

3.4 DRIP PANS FOR PROTECTION OF ELECTRICAL EQUIPMENT

- A. Examine the drawings and confirm the final location of electrical equipment to be installed in the vicinity of piping. Plan and arrange overhead piping no closer than two feet from a vertical line to electric motors and controllers, switchboards, panel boards, or similar equipment. Piping is not permitted in Electric Equipment, Transformer, Switchgear, Telephone Gear Rooms.
- B. Where the installation of piping does not comply with the requirements of foregoing paragraph, where feasible, the piping shall be relocated.
- C. Where piping cannot be relocated, furnish gutters as follows:
1. Provide and erect a gutter of 16 ounce cold rolled copper or heavy galvanized steel, under every pipe which is within 2 feet from a vertical line to any motor, electrical controllers, switchboards, panel boards, or the like.
  2. Each gutter shall be soldered and made watertight, properly suspended and carefully pitched to a convenient point for draining. Provide a 3/4 inch drain with valve as directed, to nearest floor drain or slop sink, as approved.

3. In lieu of such separate gutters, a continuous protecting sheet of similar construction adequately supported and braced, properly rimmed, pitched and drained, may be provided over any such motor, and extending 2 feet in all directions beyond the motor, over which such piping has to run.

END OF SECTION



## **SECTION 220523**

### **PLUMBING VALVES**

#### **PART 1 - GENERAL**

##### **1.1 GENERAL**

- A. Provide manual valves as shown on the drawings, specified herein, and as required for proper control and maintenance of piping systems and equipment.
- B. Valves shall be the product of one manufacturer except for special applications.
- C. Valves shall be of same minimum working pressure and materials as specified for fittings of the system in which they are installed, except as herein modified. Regardless of service, valves shall be designed for a minimum 125 psi steam working pressure. Valves shall be proven tight at the specified test pressure.
- D. Gate valves shall be suitable for repacking under system pressure.
- E. Install valves in accessible locations.
- F. Valves for equipment shutoff shall be size of pipe indicated on the drawings before reducing to equipment size.
- G. Valves in mechanical equipment rooms above 7 feet shall have chain-wheel operators.

#### **PART 2 - PRODUCTS**

##### **2.1 BUTTERFLY VALVES**

- A. Butterfly valves greater than 2 inches: lug type with carbon steel body, 316 stainless steel disc, and gear operated hand wheel. Liner shall be 317 stainless steel with PTFE woven fabric. Class 150 body, 285 psi bubble tight shut-off in either direction.
  - 1. Approved manufacture and model:
    - a. General Signal; DeZurik Unit. – Model BHP series Class 150
    - b. Bray International, Inc. – Model 40 series Class 150
    - c. Contromatics International, Inc. – Model QF series Class 150
  - 2. Domestic water system, 4 inches and larger: MSS SP-70, Class 125, 200 psi CWP, ASTM A 126 cast iron body and bonnet, solid cast iron wedge, brass alloy stem, outside screw and yoke, teflon-impregnated packing with two-piece packing gland, flanged end connections; and with cast iron hand wheel.
    - a. Approved manufacture and model:
      - 1) Crane Co.; Crane Valve Group; Crane Valves. – Model 465 ½
      - 2) Hammond Valve. – Model IR 1140
      - 3) Milwaukee Valve Company. – Model F-2885
      - 4) Watts Industries, Inc.; Water Products Div. – Model F-503

## 2.1 BALL VALVES

- A. Ball valves 3 inches and below: 600 WOG, chromium plated ball, TFE seats, blow-out proof stem, and solder connections.
  - 1. Approved manufacture and model:
    - a. Crane Co.; Crane Valve Group; Crane Valves. – Model 9323
    - b. Hammond Valve. – Model 8311
    - c. Watts Industries, Inc.; Water Products Div. – Model B-6001
    - d. Conbraco Industries, Inc.; Apollo Div. – Model 70-200

## 2.2 CHECK VALVES (PUMP DISCHARGE ONLY)

- A. Check valves shall be non-slam, silent operating, wafer type, designed to open/close at approximately 1 foot differential pressure. Check valves shall have cast iron body, replaceable lapped bronze seat, lapped and balanced twin bronze flappers loaded with stainless steel torsion spring, and stainless steel trim.
  - 1. Approved manufacture and model:
    - a. Hammond Valve. – Model IR9253
    - b. Milwaukee Valve. – Model 1400
    - c. Watts Industries, Inc.; Water Products Div. – Model ICV-125

## 2.3 CHECK VALVES

- A. Check valves shall be bronze body "Y" pattern swing check valves. Check valves shall have renewable bronze discs. Class 200 valves.
  - 1. Approved manufacture and model:
    - a. Crane Co.; Crane Valve Group; Crane Valves. – Model 36
    - b. Milwaukee Valve. – Model 508
    - c. Hammond Valve. – Model IB944

## 2.4 PLUG VALVES

- A. Plug valves 2 inches and smaller in water piping shall be of all-bronze construction with square heads and screwed connections.
- B. Plug valves greater than 2 inches in water piping shall be of all-iron construction with square heads, flanged connections and teflon seals.
- C. Plug valves in gas piping shall be gas company approved type lubricated plug valves.
  - 1. Approved manufacture and model:
    - a. 2 inches and Below:
      - 1) General Signal; DeZurik Unit. – Model 400 Series
      - 2) Homestead Valve Div. Olson Technologies Inc. – Model 120 Series

3) Val-Matic Valve & Mfg. Corp. – Model 5800R Series

b. 2-1/2 inches and Above:

1) General Signal; DeZurik Unit. – Model 100 Series

2) Homestead Valve Div. Olson Technologies Inc. – Model 120 Series

3) Val-Matic Valve & Mfg. Corp. – Model 5800R Series

## 2.5 GAS COCKS

A. Gas cocks in gas piping shall be gas company approved type lubricated cock.

## PART 3 - EXECUTION

### 3.1 GENERAL

- A. Provide shut-off valves at each plumbing fixture and at equipment requiring plumbing connections regardless of whether shown on the drawings.
- B. Provide non-slam check valves as indicated at pump discharges.
- C. Install valves so that the tops of the valve stems are above the horizontal.

END OF SECTION

## SECTION 220529

### HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT

#### PART 1 - GENERAL

##### 1.1 PIPING SYSTEM STANDARDS OF MATERIALS

- A. Piping and fitting materials shall conform to the specification standards of the recognized authorities listed below. References shall be to the latest edition in force at the time of bidding.
- B. Materials listed below shall be subject to approval of local governing authorities.
- C. Plumbing systems which connect to equipment provided or installed under the HVAC section of the drawings or specifications shall be terminated within five feet of final connection point of the equipment with a shutoff valve as specified in the plumbing valve section. Final connection is specified under the HVAC section.
- D. Each pipe length shall have the manufacturer's name cast, stamped, or rolled on.
- E. Each fitting shall have the manufacturer's symbol and pressure rating cast, stamped, or rolled on.

##### 1.2 APPLICABLE PUBLICATIONS

- A. The publications listed below form a part of this specification.
- B. Federal Specifications (Fed. Spec.):
  - L-C-530C ..... Coating, Pipe, Thermoplastic Resin
  - L-T-1512A ..... Tape, Pressure Sensitive Adhesive, Pipe Wrapping
  - 0-C-114B(2) ..... Calcium Hypochlorite, Technical
  - 0-S-602E ..... Sodium Hypochlorite Solution
  - BB-C-120C ..... Chlorine, Technical, Liquid
  - WW-V-35C ..... Valve Ball Brass or Bronze
  - WW-V-1967 ..... Valve, Butterfly (Threaded Ends And Solder Ends)
- C. American National Standards Institute (ANSI):
  - American Society of Mechanical Engineers (ASME): (Copyrighted Society)
  - A11.21.1M-80 ..... Floor Drains ANSI/ASME
  - B16.3-85 ..... Malleable Iron Threaded Fittings ANSI/ASME
  - B16.4-85 ..... Cast Iron Threaded Fittings Classes 125 and 250 ANSI/ASME
  - B16.9-86 ..... Factory-Made Wrought Steel Buttwelding Fittings ANSI/ASME
  - B16.11-80 ..... Forged Steel Fittings, Socket-Welding and Threaded ANSI/ASME
  - B16.12-83 ..... Cast Iron Threaded Drainage Fittings ANSI/ASME
  - B16.15-85 ..... Cast Bronze Threaded Fittings ANSI/ASME
  - B16.18-84 ..... Cast Copper Alloy Solder-Joint Pressure Fittings ANSI/ASME
  - B16.22-89 ..... Wrought Copper and Copper Alloy Solder Joint Pressure Fittings ANSI/ASME
  - B31.1 ..... Pipe Welding
  - B31.8-86 ..... Gas Transmission and Distribution Piping Systems ANSI/ASME
  - B40.1-85 ..... Gauges-Pressure Indicating Dial Type-Elastic Element ANSI/ASME

- D. American Society for Testing and Materials (ASTM):
- A47-84..... Ferritic Malleable Iron Castings Revision 1989
  - A53-89..... Pipe, Steel, Black And Hot-Dipped, Zinc-coated Revision A  
Welded and Seamless
  - A74-87..... Cast Iron Soil Pipe and Fittings
  - A183-83..... Carbon Steel Track Bolts and Nuts
  - A312-89..... Seamless and Welded Austenitic Stainless Steel Pipe
  - A536-84..... Ductile Iron Castings
  - A733-89..... Welded and Seamless Carbon Steel and Austenitic Stainless  
Steel Pipe Nipples
  - B32-89..... Solder Metal
  - B61-86..... Steam or Bronze Castings
  - B62-86..... Composition Bronze or Ounce Metal Castings
  - B75-86..... Seamless Copper Tube
  - B88-89..... Seamless Copper Water Tube
  - B152..... Copper Sheet
  - B-819..... Medical Gas Seamless Copper Tube
  - B306-88..... Copper Drainage Tube (DWV)
  - B584-89..... Copper Alloy Sand Castings for General Applications Revision A
  - B687-88..... Brass, Copper, and Chromium-Plated Pipe Nipples
  - C564-88 ..... Rubber Gaskets for Cast Iron Soil Pipe and Fittings
  - D2000-86 ..... Rubber Products in Automotive Applications
  - D2146-82 ..... Propylene Plastic Molding and Extrusion Materials
  - D2447-89 ..... Polyethylene (PE) Plastic Pipe, Schedule 40 and 80, Based on  
Outside Diameter
  - D2564-89 ..... Solvent Cements for Poly (Vinyl Chloride) (PVC) Pipe Plastic Pipe  
and Fittings
  - D2665-89 ..... Poly (Vinyl Chloride) (PVC) Plastic Drain, Waste, and Revision A  
Vent Pipe and Fittings
  - D4101-82 ..... Propylene Plastic Injection and Extrusion Materials
- E. American Water Works Association (AWWA):
- C151-86 ..... Ductile-Iron Pipe, Centrifugally Cast in Metal Molds or Sand-Lined  
Molds, for Water or Other Liquids
  - C203-86 ..... Coal-Tar Protective Coatings and Linings for Steel Water  
Pipelines - Enamel and Tape - Hot Applied
  - C651-86 ..... Disinfecting Water Mains
  - C701-88 ..... Cold Water Meters-Turbine Type, for Customer Service
- F. National Fire Protection Association (NFPA):
- 54-88 ..... National Fuel Gas Code
- G. American Welding Society (AWS):
- A5.8-89..... Filler Metals for Brazing
- H. National Association of Plumbing - Heating - Cooling Contractors (PHCC):
- National Standard Plumbing Code - 1990
- I. Cast Iron Soil Pipe Institute (CISPI):
- 301-85 ..... Hubless Cast Iron Soil and Fittings

- J. International Association of Plumbing and Mechanical Officials (IAPMO):  
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- K. Manufacturers Standardization Society of the Valve and Fittings Industry, Inc. (MSS):  
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- L. American Society of Sanitary Engineers (ASSE):  
1003 ..... Water Pressure Reducing Valves  
1010 ..... Water Hammer Arresters  
1001-70 ..... Pipe Applied Atmospheric Type Vacuum Breakers  
1013-88 ..... Reduced Pressure Principle Backflow Preventers  
1015-88 ..... Double Check Backflow Prevention Assembly  
1020-81 ..... Vacuum Breakers, Anti-Siphon, Pressure Type
- M. Factory Mutual (FM):  
1680-89 ..... Coupling Used in Hubless Cast Iron Systems for Drains, Waste and Vent Systems.

## PART 2 - PRODUCTS

### 2.1 PIPE HANGERS AND SUPPORTS

- A. General
  - 1. Hanger design shall conform to ANSI Code B 31.1.0 for Pressure Piping and the Manufacturers' Standardization Society of the Valve and Fitting Industry, (MSS) SP-58 and SP-69, unless supplemented or modified herein.
  - 2. Specified bracket clamp and rod sizes are minimum sizes. Support and hanger design shall include a safety factor of 5.
  - 3. Approved type trapeze hangers may be used instead of separate clevis hangers, with suspension rods having double nuts and securely attached to the construction in an approved manner.
  - 4. Plastic-coated hangers and clamps shall be provided for uninsulated brass or copper pipe, unless shields are provided between hangers or clamps and uninsulated brass or copper pipe.
  - 5. Provide steel required for support of pipes other than steel shown on structural drawings.
  - 6. Chain straps, perforated bars, wire hangers or expansion shields are not permitted.
  - 7. Inserts for piping shall be of a type which shall not interfere with structural reinforcing and which shall not displace excessive amounts of concrete.
  - 8. Piping located near floors that can be supported from floor or walls shall be provided with approved floor stands, wall brackets, roller supports, masonry piers or similar items.
  - 9. Resilient hangers and isolation devices shall be provided on piping connected to rotating equipment, including pumps, air handling units, and on other piping

which may vibrate and create audible noise. See Section 15057, Vibration Isolation, of the Specification

10. Rigid hangers for horizontal piping shall provide a means of vertical adjustment after erection.
11. Hangers or supports shall be provided for existing piping that is to remain in areas affected by demolition.
12. Vertical piping shall utilize riser clamp specifically designed for piping.

B. Pipe Hanger Schedule

1. Manufacturers' Model Numbers

Hanger Type	F&S	F&M	Grinnell	Central Iron
360 shield, split	981	---	---	548
Beam Clamp	55	282	218	39
Multi-J hook blade	120	---	---	208
Clevis hangar	86	239	260	10
180 degree shield	980	80	167	550
Rigid trapeze	710	---	Std. 46	551
U-bolt	37	176	137, 137C	98H
Adj. steel pipe stanchion	421	291	259	71
Welded steel bracket	800, 801	151, 155	195, 199	195, 199
Riser clamp	91, 93, 94	241	261, 261C	37, 261
Pipe rest	92, 925	---	---	552
Base elbow support	720, 721	---	---	67, 68
Dbl. bolt pipe clamp	89	261	295	295
Welded beam attach.	966	---	66	66
Insert	180A, 180B	178	280 Series	100, 101
Cont. slotted insert	150A, 150B	190	---	50
Underground pipe hanger	275	---	---	600A

C. Hanger Rod Schedules

Pipe Size	Minimum Rod Size
Up to 2 inches	3/8 inch diameter
2-1/2 inches to 4 inches	1/2 inch diameter
4 inches to 5 inches	5/8 inch diameter
Above 5 inches	Special design

## PART 3 - EXECUTION

### 3.1 GENERAL

- A. Provide adequate provision for expansion and contraction in portions of the piping systems, to prevent undue strains on piping, building anchor points, and connected equipment.
- B. Piping connections to plumbing fixtures and equipment shall be provided with offsets and shutoff valves arranged such that equipment can be serviced or removed without dismantling the pipe.
- C. Pitch water piping up in direction of flow to ensure adequate flow without air binding and to prevent noise and water hammer. Branch connections to mains shall be made in such a manner as to prevent air trapping and prevent free passage of air. Mains shall be laid out to meet field conditions, maintain adequate headroom and clear work.
- D. Any piping passing through roof construction shall be arranged to provide a minimum of 12 inch clearance from walls or other obstructions so as to permit proper flashing. Set pipe flashing fittings at a suitable level above the roof to permit proper termination of flashing.
- E. Converging or diverging Bullheaded Tee's are not permitted.
- F. Provide hose drain connections on water systems downstream of floor main shut-off valves.

### 3.2 PIPE HANGERS AND SUPPORTS

#### A. Pipe Hanger Support Schedule

Building Construction	Pipe Support Method
Poured concrete floor slabs	Galvanized steel inserts, and/or fish plates of sufficient area to support twice the calculated dead load
Building structural steel	Beam attachments and similar devices
Precast concrete floor slabs	Fish plates of sufficient area to support twice the calculated dead load and approve type specialty hanger accessories manufactured for the specific purpose of attaching to precast floors
Metal deck floor slabs with concrete fill	Galvanized steel inserts and/or fish plates of sufficient area to support twice the calculated dead load, and approved type specialty hanger accessories manufactured for the specific purpose of attaching to metal deck floors
Concrete slabs where piping revisions are required and approved after slabs are poured or existing slabs	"Phillips" or "Hilti" expansion bolts and shields for piping 4 inches and smaller, with main supports welded to structural steel at maximum 20 feet on center 4 inch x 4 inch x 3/8 inch thick clip knee angles with 3/4 inch expansion bolt in shear (horizontal) and supporting rod at 90° from anchor bolt for piping greater than 4 inches, attached to concrete beams or columns
Concrete floor slabs on	Drainage, waste and vent piping to be encased in slab



Building Construction	Pipe Support Method
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grade with ground water condition	construction
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B. Pipe Support Spacing

1. Pipe supports shall be spaced as follows:

Less than 3/4 inch pipe	On 5 foot centers
1 inch and 1-1/4 inch pipe	On 6 foot centers
1-1/2 inch to 2-1/2 inch pipe	On 10 foot centers
3 inch and 4 inch pipe	On 12 foot centers
6 inch and larger pipe	On 15 foot centers
Cast iron soil pipe	Support at every joint

2. Provide hangers no more than 12 inches from direction changes.

END OF SECTION

## **SECTION 230553**

### **IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT**

#### **PART 1 - GENERAL**

##### **1.1 DESCRIPTION**

- A. Provide identification of plumbing piping, valves, and equipment.

##### **1.2 STANDARDS**

- A. ANSI/ASME A13.1: Scheme for the Identification of Piping Systems.

##### **1.3 ACCEPTABLE MANUFACTURERS**

- A. Seton, W.H. Brady, Bunting, or EMED Company. Provide specific model numbers where indicated.

##### **1.4 SHOP DRAWING REQUIREMENTS**

- A. Submittal not required.

#### **PART 2 - PRODUCTS**

##### **2.1 PIPE IDENTIFICATION**

- A. Pipe Markers (Above Ground—Indoor)
  - 1. Pipe bands indicating contents and flow direction shall be flexible vinyl film with acrylic pressure sensitive adhesive suitable for pipe surface temperatures of -40°F to 220°F.
  - 2. Product:
    - a. Seton Opticode
    - b. W.H. Brady B-350 Perma-Code
    - c. Bunting Identiflow
- B. Pipe Markers (Above Ground—Outdoor)
  - 1. Pipe bands indicating contents and flow direction shall be snap-on markers consisting of a surface-printed and overcoat-protected vinyl base material suitable for pipe surface temperatures from -40°F to 150°F.
  - 2. Product:
    - a. Seton Weather-Code, Style AA
    - b. W.H. Brady B-915 BradySnap-On
    - c. Bunting

C. Pipe Markers (Underground)

1. Metallic Pipe - Underground metallic pipe shall be identified by underground warning tape. Tape shall be 0.004 inch thick, 6 inch wide polyethylene tape, color coded, with continuous message stating "Caution" and stating which type of pipe is buried.
2. Nonmetallic Pipe - Underground nonmetallic pipe shall be identified by underground metallic warning tape. Tape shall be 0.004 inch thick, 6 inch wide polyethylene tape with metallic core, color coded, with continuous message stating "Caution" and stating the type of pipe buried.

D. Pipe marking shall comply with ANSI A13.1 Scheme for the Identification of Pipe Systems. Markers shall be in compliance with respect to:

1. Marker length
2. Background color
3. Letter color
4. Letter size

2.2 EQUIPMENT NAMEPLATES

- A. Heavy gauge (.025) aluminum with four mounting holes. Coloring in background, lettering, and pads in aluminum.

2.3 VALVE TAGS

- A. Brass with stamped numbers and letters (black-filled), 1-1/2 inch square with 1/2 inch numbers and 1/4 inch letters.
- B. Fastening shall be by brass "S" hooks, brass jack chains, or brass ball chains.

2.4 VALVE CHARTS

- A. 8-1/2 inch by 11 inch (minimum or of sufficient size), wood or aluminum frames with Plexiglas covers. Include valve numbers, sizes, functions, and locations. Coordinate location with Owner. Chart shall have key plan denoting approximate valve location.

PART 3 - EXECUTION

3.1 PIPE IDENTIFICATION

- A. Pipe locations to be marked are as follows:
1. Piping shall also have direction of flow arrows matching the legend and background colors adjacent to each marker and at branches.
  2. Markers shall be placed on piping at 20 foot maximum intervals. In addition, wherever a pipe passes through a wall, floor, or ceiling, it should be marked on each side of the wall, floor, or ceiling. Where pipe insulation or pipe is to be painted, it should be painted to match the background color of its contents (as

indicated below). Fire protection piping should be painted red. In addition to pipe marking, valves shall have brass tags indicating system and valve number.

- B. Colors for pipe marking systems shall be in accordance with ANSI standards.
- C. Underground piping shall be identified with identification tape continuously while below grade. Depth of tape shall be 12 inches below grade for piping buried up to 30 inches deep, and 18 to 24 inches above pipe for depths below 30 inches deep.

### 3.2 VALVE IDENTIFICATION

- A. Provide identification tags for valves including control valves and shutoff valves serving individual fixtures and equipment shall not be tagged.
- B. Provide valve charts in an approved location secured to wall.
- C. Include a copy of the valve chart in each operation and maintenance manual.

END OF SECTION

## SECTION 220719

### PLUMBING PIPING AND EQUIPMENT INSULATION

#### PART 1 - GENERAL

##### 1.1 GENERAL

- A. Unless specifically noted otherwise, insulation shall have composite fire and smoke hazard ratings (including insulation, jacket or facing, PVC covers, and adhesives), as tested by ASTM E84, NFPA 255 or UL 723 procedures, not exceeding a flame spread rating of 25 and smoke developed rating of 50.
- B. Piping systems, which includes existing piping that may need reinsulated, shall be insulated in accordance with the schedule below, including flanges, fittings, valves, expansion joints, vents, drains and similar appurtenances. Piping subject to freezing shall be insulated with a minimum of 2 inches insulation.
- C. Piping tests shall be completed before insulation proceeds.
- D. Insulation shall be provided continuously through sleeves and openings.
- E. Adhesives and coatings shall be as manufactured by Benjamin-Foster or equivalent.
  - 1. Vapor Barrier Adhesive: Benjamin Foster 80-07.
  - 2. Vapor Barrier Coating: Benjamin Foster 30-35.
  - 3. Lagging Adhesive: Benjamin Foster 85-20.
  - 4. Glass Cloth Adhesive: Benjamin Foster 85-20.
  - 5. Weatherproofing Mastic: Benjamin Foster 48-00.
- F. Asbestos shall not be used in the manufacture of insulation products.
- G. Refer to Section 220517 for verminproof insulation in sleeves.

#### PART 2 – PRODUCTS

##### 2.1 PIPING SYSTEM INSULATION

- A. Domestic cold and hot water piping, including hot water recirculating piping shall be insulated with 1 inch fiberglass.
- B. Horizontal storm water piping, drain bodies, and storm water located above hung ceilings shall be insulated with ½ inch fiberglass.
- C. Emergency generator exhaust shall be insulated with 4 inch calcium silicate block insulation having aluminum or stainless steel cover for insulation outdoors..
- D. Exterior domestic piping shall be insulated with 2 inch fiberglass.
- E. Piping with electric heat trace shall be insulated with 2 inch fiberglass having weather – proof jacket.
- F. Fuel oil supply and return piping shall be insulated with ½ inch fiberglass sealed with vapor barrier adhesive.

## 2.2 FIBER GLASS INSULATION

- A. Insulation, including fiberglass inserts, shall be glass fiber with a maximum K factor of 0.24 at 75 degrees F mean temperature with factory applied all-service jacket with self-sealing lip. Exposed pipe insulation material must be the one piece type. Sectional type may be used for concealed piping.
- B. Seal butt joints with 3 inch wide butt stripe adhered neatly in place..
- C. Product: Owens-Corning SSL-11, Manville Micro-Lok, Knauff ASJ-SSL, Certainteed Alley-K.

## 2.3 CALCIUM SILICATE BLOCK INSULATION

- A. Insulation shall be 11 pounds per cubic foot density molded asbestos-free hydrous calcium silicate with a K factor of 0.38 at 200°F mean temperature. Insulation shall be fastened in place with adhesive as per manufacturer's recommendations and 16 gauge copper-clad wire on 9 inch maximum centers. Fill joints with insulating cement.
- B. Provide 1 inch galvanized wire mesh on insulated surfaces. Secure and provide tight. Apply 1/4 inch thick finishing cement. Use corner beads for a smooth finish where insulation is terminated.
- C. For insulation outdoors, provide 0.024 inch thick stainless steel jacket banded, overlapped, secured with pop rivets or screws, and sealant placed on joints as per manufacturer's recommendations for a watertight finish.
- D. Product: Owens-Corning calcium silicate insulation, Manville Thermo-12, Knauff Temperlite 1200, Certainteed Calmax.

## PART 3 - EXECUTION

### 3.1 GENERAL

- A. Insulation shall be applied on clean, dry surfaces.
- B. Insulation shall be continuous through construction openings and sleeves.
- C. Insulation on cold surfaces where vapor barrier jackets are required shall be applied with a continuous, unbroken vapor seal. Hangers, supports, anchors and similar devices that are secured directly to cold surfaces shall be adequately insulated and vapor sealed to prevent condensation.
- D. For pipe handling fluids below 70°F, provide one of the following means of preventing contact between pipe insulation and hanger or support:
  - 1. High density rigid fiberglass insulation insert, equal in thickness to pipe insulation, with factory applied jacket and metal protection shield at a width equal to 1/2 the outside insulation diameter and a length equal to 12 inches for piping to 5 inches in diameter and 24 inches for piping 6 inches in diameter and larger installed between pipe and hanger or support. Shield gauge thickness shall be 18 gauge for piping 4 inches in diameter and less and 16 gauge for piping 5 inches in diameter and larger.
- E. For piping handling fluids 70°F and above, rest pipe directly on hanger, insulate pipe and hanger.
- F. Apply insulation in strict accordance with manufacturer's recommendations.

- G. Piping located on roof shall have 18 gauge stainless steel shield a minimum of 36 inches in length the full circumference of pipe. Locate where insulation will be stepped on due to maintenance traffic.

END OF SECTION

## SECTION 221116

### DOMESTIC WATER PIPING

#### PART 1 - GENERAL

##### 1.1 PIPING SYSTEM STANDARDS OF MATERIALS

- A. Piping and fitting materials shall conform to the specification standards of the recognized authorities listed below. References shall be to the latest edition in force at the time of bidding.
- B. Materials listed below shall be subject to approval of local governing authorities.
- C. Plumbing systems which connect to equipment provided or installed under the HVAC section of the drawings or specifications shall be terminated within five feet of final connection point of the equipment with a shutoff valve as specified in the plumbing valve section. Final connection is specified under the HVAC section.
- D. Each pipe length shall have the manufacturer's name cast, stamped, or rolled on.
- E. Each fitting shall have the manufacturer's symbol and pressure rating cast, stamped, or rolled on.

##### 1.2 APPLICABLE PUBLICATIONS

- A. The publications listed below form a part of this specification.
- B. Federal Specifications (Fed. Spec.):
  - L-C-530C ..... Coating, Pipe, Thermoplastic Resin
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  - B306-88..... Copper Drainage Tube (DWV)
  - B584-89..... Copper Alloy Sand Castings for General Applications Revision A
  - B687-88..... Brass, Copper, and Chromium-Plated Pipe Nipples
  - C564-88 ..... Rubber Gaskets for Cast Iron Soil Pipe and Fittings
  - D2000-86 ..... Rubber Products in Automotive Applications
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  - D2564-89 ..... Solvent Cements for Poly (Vinyl Chloride) (PVC) Pipe Plastic Pipe  
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- E. American Water Works Association (AWWA):
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Pipelines - Enamel and Tape - Hot Applied
  - C651-86 ..... Disinfecting Water Mains
  - C701-88 ..... Cold Water Meters-Turbine Type, for Customer Service
- F. National Fire Protection Association (NFPA):
- 54-88 ..... National Fuel Gas Code
- G. American Welding Society (AWS):
- A5.8-89..... Filler Metals for Brazing
- H. National Association of Plumbing - Heating - Cooling Contractors (PHCC):
- National Standard Plumbing Code - 2009
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- 301-85 ..... Hubless Cast Iron Soil and Fittings

- J. International Association of Plumbing and Mechanical Officials (IAPMO):  
Uniform Plumbing Code - 1988  
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- K. Manufacturers Standardization Society of the Valve and Fittings Industry, Inc. (MSS):  
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1010 ..... Water Hammer Arresters  
1001-70 ..... Pipe Applied Atmospheric Type Vacuum Breakers  
1013-88 ..... Reduced Pressure Principle Backflow Preventers  
1015-88 ..... Double Check Backflow Prevention Assembly  
1020-81 ..... Vacuum Breakers, Anti-Siphon, Pressure Type
- M. Factory Mutual (FM):  
1680-89 ..... Coupling Used in Hubless Cast Iron Systems for Drains, Waste and Vent Systems.

## PART 2 - PRODUCTS

### 2.1 PIPING AND FITTINGS MATERIAL SCHEDULE

- A. Piping systems shall be constructed of the following materials as scheduled below, subject to approval by authorities having jurisdiction.

Systems	Pipe	Fittings	Remarks
Relief valve discharge piping	Type L hard drawn copper tubing w/95-5 tin antimony solder joints	Cast bronze or wrought copper with solder joints	
Cold water piping, underground, 2-1/2 inches and smaller	Type K soft drawn copper tubing, with 95-5 tin antimony or 96-4 tin silver	Wrought copper fittings, solder joint	Fitting pressure rating as per ANSI B16.18, B16.22
Interior building or above ground domestic water systems, 4 inches and smaller (cold water systems)	Type L hard drawn copper tubing with 95-5 tin antimony solder joints	Cast bronze or wrought copper with solder joints	Fitting pressure rating as per ANSI B16.22, B16.18,
Interior building or above ground domestic water systems, 4 inches and smaller (hot and hot water circulating systems)	Type L hard drawn copper tubing with 95-5 tin antimony solder joints	Cast bronze or wrought copper with solder joints	Fitting pressure rating as per ANSI B16.22, B16.18,

Systems	Pipe	Fittings	Remarks
Exposed final connections to fixtures	Chromium plated brass	Chromium plated brass	Fitting pressure rating: 125 lb. steam
	Schedule 40 black steel pipe	Welded steel fittings	1) Pipe coating and anodes in accordance with gas company requirements 2) Welding to be performed by a certified welder

#### B. Escutcheon Plates

##### 1. Schedule of Escutcheon Plate Materials

<u>Location</u>	<u>Escutcheon Plate Material</u>
Finished spaces	Anodized aluminum or chrome-plated brass
Unfinished spaces	Plain brass, cast iron or aluminum

#### 2.2 PLUMBING PIPING SYSTEM PRESSURE CLASSIFICATION

2.3 Piping, fittings, components, and equipment for domestic plumbing piping systems shall have an operating pressure of 75 psig and a component rating pressure of 125 psig.

#### 2.4 PIPE FLASHING FITTINGS

A. Pipes passing through roof construction shall be provided with pipe portal type curb.

#### 2.5 PIPE WELDING

A. Refer to Basic Materials and Methods, Section 15050, for welding requirements on piping.

### PART 3 - EXECUTION

#### 3.1 GENERAL

- A. The drawings schematically indicate the size and location of piping. Piping system layout shall be modified as required to meet field conditions and facilitate coordination. Piping shall conform to the latest ASA code for pressure piping. Unless otherwise noted, all piping, valves, and associated fittings shall be concealed behind walls, above ceilings, or below floors.
- B. Provide adequate provision for expansion and contraction in portions of the piping systems, to prevent undue strains on piping, building anchor points, and connected equipment.
- C. Piping connections to plumbing fixtures and equipment shall be provided with offsets and shutoff valves arranged such that equipment can be serviced or removed without dismantling the pipe.
- D. Pitch water piping up in direction of flow to ensure adequate flow without air binding and to prevent noise and water hammer. Branch connections to mains shall be made

in such a manner as to prevent air trapping and prevent free passage of air. Mains shall be laid out to meet field conditions, maintain adequate headroom and clear work.

- E. Any piping passing through roof construction shall be arranged to provide a minimum of 12 inch clearance from walls or other obstructions so as to permit proper flashing. Set pipe flashing fittings at a suitable level above the roof to permit proper termination of flashing.
- F. Converging or diverging Bullheaded Tee's are not permitted.
- G. Provide hose drain connections on water systems downstream of floor main shut-off valves.

### 3.2 PIPING SYSTEM PRESSURE TESTS

- A. The following procedures shall be observed for piping system pressure tests:
  - 1. Preliminary testing, notification of inspectors and other responsibilities as specified in Section 220500, Paragraph 1.7 - CODES, PERMITS AND INSPECTIONS shall be observed.
  - 2. Take all due precautions to prevent damage to the building and its contents that may be incurred by such tests; repair or make good any damage caused by the tests at no additional cost to the Owner.
  - 3. Tests shall apply full test pressure to the piping for a sufficient period of time to detect leaks and defects. Refer to individual piping testing procedures for approved testing of liquids or gases.
  - 4. Tests shall be conducted prior to the installation of any required fitting insulation. If delicate control mechanisms, not including control valves, are installed in the piping, they shall be removed to prevent shock damage.
  - 5. The section of piping to be tested shall be brought up to the specified test pressure. If the test pressure falls more than the specified amount during the test period, the point of leakage shall be found, repaired and the test repeated. This procedure shall be repeated until the piping system has been proved absolutely tight.
  - 6. Leaks shall be repaired by removing the valve, fitting, joint or section that is leaking and reinstalling new materials and joints as specified. Use of mastic or "no-leak" compounds or other temporary means of repairing leaks shall not be permitted.

### 3.3 DOMESTIC WATER SYSTEM (COLD, HOT, TEMPERED, AND RECIRCULATING SYSTEMS)

- A. Installation Procedures
  - 1. Water piping shall be arranged to drain to low points and to provide for air elimination at high points.
  - 2. Mains, risers and branch connections to same shall be arranged to permit expansion and contraction without strain by means of elbow swings and/or expansion joints.
  - 3. A riser control valve shall be provided on each water riser. Provide a drain valve on each riser located downstream of riser control valve on upfeed risers.

4. Valves, check valves, reducing valves, shock absorbers, tempering valves, etc. shall be easily accessible for maintenance and/or removal.
5. Screwed joints shall be made with best quality approved pipe compound, carefully placed on male threads only and not on the fittings.
6. Cut and threaded pipe shall have the cutting burrs and sharp edges reamed out.
7. In erecting pipe, friction wrenches shall be used exclusively, and any pipe cut, dented or otherwise damaged shall be replaced.
8. Ferrous to non-ferrous pipe connections shall be made with Epco Sales, Inc., or other approved dielectric pipe or flange union isolating joints to prevent any electrolytic action between dissimilar metals.
9. Copper pipe and tubing shall be cut square and reamed out to remove burrs. Outside and inside of the fittings and outside of the tubing at each end shall be well cleaned with steel wool before brazing to remove traces of oxidation regardless of how clean the surfaces of the pipe and fittings may appear.

**B. Domestic Water System Pressure Test**

1. The entire domestic water system shall be tested to a hydrostatic pressure equal to 1-1/2 times the system normal operating pressure.
2. The water used for the pressure test shall be supplied from a potable water source.

**C. Cleaning, Flushing and Disinfection**

1. Before being placed in operation, the domestic water piping systems shall be cleaned, flushed and disinfected in strict accordance with the requirements of the local health department or other authorities having jurisdiction.
2. The piping systems shall be sterilized with a solution containing not less than 50 parts per million of chlorine, which shall conform to the standards of the American Water Works Association, and the solution shall be introduced into the system in an approved manner. The solution shall be allowed to remain in the system for a minimum period of 24 hours. During the sterilization period, valves and outlets shall be opened and closed several times. After the sterilization period, the solution shall be flushed from the system using clean water until the residual chlorine content is less than 0.2 parts per million, or as required by the local health department or other authority having jurisdiction.
3. Required water samples shall be taken and submitted to an approved laboratory for routine bacteriological examination. Copies of the test results shall be submitted to the Architect and the local health department or other authority having jurisdiction.
4. Provide the means for disposing the solution used to disinfect the system. The solution shall be disposed of in an approved manner that shall eliminate the possibility of damage to property or contamination of the water supply.

**END OF SECTION**

## SECTION 221123

### NATURAL GAS PIPING

#### PART 1 - GENERAL

##### 1.1 PIPING SYSTEM STANDARDS OF MATERIALS

- A. Piping and fitting materials shall conform to the specification standards of the recognized authorities listed below. References shall be to the latest edition in force at the time of bidding.
- B. Materials listed below shall be subject to approval of local governing authorities.
- C. Plumbing systems which connect to equipment provided or installed under the HVAC section of the drawings or specifications shall be terminated within five feet of final connection point of the equipment with a shutoff valve as specified in the plumbing valve section. Final connection is specified under the HVAC section.
- D. Each pipe length shall have the manufacturer's name cast, stamped, or rolled on.
- E. Each fitting shall have the manufacturer's symbol and pressure rating cast, stamped, or rolled on.

##### 1.2 APPLICABLE PUBLICATIONS

- A. The publications listed below form a part of this specification.
- B. Federal Specifications (Fed. Spec.):
  - L-C-530C ..... Coating, Pipe, Thermoplastic Resin
  - L-T-1512A ..... Tape, Pressure Sensitive Adhesive, Pipe Wrapping
  - WW-V-35C ..... Valve Ball Brass or Bronze
  - WW-V-1967 ..... Valve, Butterfly (Threaded Ends And Solder Ends)
- C. American National Standards Institute (ANSI):
  - American Society of Mechanical Engineers (ASME): (Copyrighted Society)
  - B16.3-85 ..... Malleable Iron Threaded Fittings ANSI/ASME
  - B16.4-85 ..... Cast Iron Threaded Fittings Classes 125 and 250 ANSI/ASME
  - B16.11-80 ..... Forged Steel Fittings, Socket-Welding and Threaded ANSI/ASME
  - B16.15-85 ..... Cast Bronze Threaded Fittings ANSI/ASME
  - B31.1 ..... Pipe Welding
  - B31.8-86 ..... Gas Transmission and Distribution Piping Systems ANSI/ASME
  - B40.1-85 ..... Gauges-Pressure Indicating Dial Type-Elastic Element  
ANSI/ASME
- D. American Society for Testing and Materials (ASTM):
  - A47-84 ..... Ferritic Malleable Iron Castings Revision 1989
  - A53-89 ..... Pipe, Steel, Black And Hot-Dipped, Zinc-coated Revision A  
Welded and Seamless
  - A183-83 ..... Carbon Steel Track Bolts and Nuts
  - A312-89 ..... Seamless and Welded Austenitic Stainless Steel Pipe
  - A536-84 ..... Ductile Iron Castings
  - A733-89 ..... Welded and Seamless Carbon Steel and Austenitic Stainless  
Steel Pipe Nipples
  - B32-89 ..... Solder Metal

- B62-86..... Composition Bronze or Ounce Metal Castings
- B75-86..... Seamless Copper Tube
- D2564-89 ..... Solvent Cements for Poly (Vinyl Chloride) (PVC) Pipe Plastic Pipe and Fittings
- D4101-82 ..... Propylene Plastic Injection and Extrusion Materials
- E. American Welding Society (AWS):
  - A5.8-89..... Filler Metals for Brazing
- F. National Association of Plumbing - Heating - Cooling Contractors (PHCC):
  - National Standard Plumbing Code - 1990
- G. International Association of Plumbing and Mechanical Officials (IAPMO):
  - Uniform Plumbing Code - 1988
  - IS6-82..... Installation Standard
- H. Manufacturers Standardization Society of the Valve and Fittings Industry, Inc. (MSS):
  - SP-70-84 ..... Cast Iron Gate Valves, Flanged and Threaded Ends.

## PART 2 - PRODUCTS

### 2.1 PIPING AND FITTINGS MATERIAL SCHEDULE

- A. Piping systems shall be constructed of the following materials as scheduled below, subject to approval by authorities having jurisdiction.

Systems	Pipe	Fittings	Remarks
Natural gas piping inside building	Schedule 40 black steel pipe	Screwed malleable iron for fittings 2 inches and smaller, welded steel for fittings larger than 2 inches	1) Pipe painting and support in accordance with gas company requirements  2) Welding to be performed by a certified welder  3) Sleeve and vent for gas pipe in ceiling space and riser per gas company requirements

### 2.2 PLUMBING PIPING SYSTEM PRESSURE CLASSIFICATION

- 1. Piping, fittings, components, and equipment for natural gas systems shall have an operating pressure of 4 inches and a component rating pressure of 125 psig.

## PART 3 - EXECUTION

### 3.1 GENERAL

- A. The drawings schematically indicate the size and location of piping. Piping system layout shall be modified as required to meet field conditions and facilitate coordination. Piping shall conform to the latest ASA code for pressure piping. Unless otherwise noted, all piping, valves, and associated fittings shall be concealed behind walls, above ceilings, or below floors.
- B. Provide adequate provision for expansion and contraction in portions of the piping systems, to prevent undue strains on piping, building anchor points, and connected equipment.
- C. Piping connections to plumbing fixtures and equipment shall be provided with offsets and shutoff valves arranged such that equipment can be serviced or removed without dismantling the pipe.
- D. Any piping passing through roof construction shall be arranged to provide a minimum of 12 inch clearance from walls or other obstructions so as to permit proper flashing. Set pipe flashing fittings at a suitable level above the roof to permit proper termination of flashing.
- E. Converging or diverging Bullheaded Tee's are not permitted.
- F. Provide hose drain connections on water systems downstream of floor main shut-off valves.

### 3.2 PIPING SYSTEM PRESSURE TESTS

- A. The following procedures shall be observed for piping system pressure tests:
  - 1. Preliminary testing, notification of inspectors and other responsibilities as specified in Section 15010, Paragraph 1.9 - CODES, PERMITS AND INSPECTIONS shall be observed.
  - 2. Take all due precautions to prevent damage to the building and its contents that may be incurred by such tests; repair or make good any damage caused by the tests at no additional cost to the Owner.
  - 3. Tests shall apply full test pressure to the piping for a sufficient period of time to detect leaks and defects. Refer to individual piping testing procedures for approved testing of liquids or gases.
  - 4. Tests shall be conducted prior to the installation of any required fitting insulation. If delicate control mechanisms, not including control valves, are installed in the piping, they shall be removed to prevent shock damage.
  - 5. The section of piping to be tested shall be brought up to the specified test pressure. If the test pressure falls more than the specified amount during the test period, the point of leakage shall be found, repaired and the test repeated. This procedure shall be repeated until the piping system has been proved absolutely tight.
  - 6. Leaks shall be repaired by removing the valve, fitting, joint or section that is leaking and reinstalling new materials and joints as specified. Use of mastic of "no-leak" compounds or other temporary means of repairing leaks shall not be permitted.



### 3.3 NATURAL GAS SYSTEM

#### A. Installation Procedure

1. Piping shall be installed without pockets, with drips at low points and with valves at each outlet.
2. Final connections shall be made to pieces of equipment.
3. Right and left nipples shall not be used in lieu of unions.
4. Complete gas service connections to existing gas utility mains with service extensions into buildings, piping, valves, metering and pressure regulation in accordance with utility company requirements.
5. Provide plug valves at gas piping risers and main control points.
6. Provide gas cocks at gas equipment and appliances.

#### B. Natural Gas System Inspection

1. Every third weld in the gas riser piping shall be x-ray inspected in accordance with the gas company requirements. The results of the tests shall be forward to the gas company and to the Architect.

#### C. Natural Gas System Testing

1. The entire gas piping system shall be tested in accordance with the gas company requirements. At a minimum, piping shall be tested at a pressure of 90 psig for 24 hours using a recording type pressure gauge. Test natural gas sleeves at a pressure of 90 psig for 24 hours using a recording type pressure gauge. Equipment, materials and services required shall be provided.
2. Final tests shall be conducted in the presence of and to the satisfaction of the Architect and inspectors of any and all authorities having jurisdiction, including the gas company, who shall be notified a minimum of 48 hours in advance of same. Preliminary testing shall be completed prior to such notification.
3. While subjected to the test pressure, the piping system shall be visually examined for signs of leakage or other defects. Exposed joints shall be checked by means of a soap bubble test or other foaming agent test. Any reduction to test pressure measured by the gauge during the testing period shall be deemed to indicate the presence of a leak unless such reduction can be readily attributable to some other cause.
4. Test records shall be maintained during the testing and shall confirm that piping has been pressure tested as specified above.
5. Purging of piping shall be accomplished in accordance with the provisions contained in USAS-Z-83.1.

END OF SECTION

## SECTION 221316

### SANITARY WASTE AND VENT PIPING

#### PART 1 - GENERAL

##### 1.1 PIPING SYSTEM STANDARDS OF MATERIALS

- A. Piping and fitting materials shall conform to the specification standards of the recognized authorities listed below. References shall be to the latest edition in force at the time of bidding.
- B. Materials listed below shall be subject to approval of local governing authorities.
- C. Plumbing systems which connect to equipment provided or installed under the HVAC section of the drawings or specifications shall be terminated within five feet of final connection point of the equipment with a shutoff valve as specified in the plumbing valve section. Final connection is specified under the HVAC section.
- D. Each pipe length shall have the manufacturer's name cast, stamped, or rolled on.
- E. Each fitting shall have the manufacturer's symbol and pressure rating cast, stamped, or rolled on.

##### 1.2 APPLICABLE PUBLICATIONS

- A. The publications listed below form a part of this specification.
- B. Federal Specifications (Fed. Spec.):
  - L-C-530C ..... Coating, Pipe, Thermoplastic Resin
  - L-T-1512A ..... Tape, Pressure Sensitive Adhesive, Pipe Wrapping
  - 0-C-114B(2) ..... Calcium Hypochlorite, Technical
  - 0-S-602E ..... Sodium Hypochlorite Solution
  - BB-C-120C ..... Chlorine, Technical, Liquid
  - WW-V-35C ..... Valve Ball Brass or Bronze
  - WW-V-1967 ..... Valve, Butterfly (Threaded Ends And Solder Ends)
- C. American National Standards Institute (ANSI):
  - American Society of Mechanical Engineers (ASME): (Copyrighted Society)
  - A11.21.1M-80 ..... Floor Drains ANSI/ASME
  - B16.3-85 ..... Malleable Iron Threaded Fittings ANSI/ASME
  - B16.4-85 ..... Cast Iron Threaded Fittings Classes 125 and 250 ANSI/ASME
  - B16.9-86 ..... Factory-Made Wrought Steel Buttwelding Fittings ANSI/ASME
  - B16.11-80 ..... Forged Steel Fittings, Socket-Welding and Threaded ANSI/ASME
  - B16.12-83 ..... Cast Iron Threaded Drainage Fittings ANSI/ASME
  - B16.15-85 ..... Cast Bronze Threaded Fittings ANSI/ASME
  - B16.18-84 ..... Cast Copper Alloy Solder-Joint Pressure Fittings ANSI/ASME
  - B16.22-89 ..... Wrought Copper and Copper Alloy Solder Joint Pressure Fittings ANSI/ASME
  - B31.1 ..... Pipe Welding
  - B31.8-86 ..... Gas Transmission and Distribution Piping Systems ANSI/ASME
  - B40.1-85 ..... Gauges-Pressure Indicating Dial Type-Elastic Element ANSI/ASME

- D. American Society for Testing and Materials (ASTM):
- A47-84..... Ferritic Malleable Iron Castings Revision 1989
  - A53-89..... Pipe, Steel, Black And Hot-Dipped, Zinc-coated Revision A  
Welded and Seamless
  - A74-87..... Cast Iron Soil Pipe and Fittings
  - A183-83..... Carbon Steel Track Bolts and Nuts
  - A312-89..... Seamless and Welded Austenitic Stainless Steel Pipe
  - A536-84..... Ductile Iron Castings
  - A733-89..... Welded and Seamless Carbon Steel and Austenitic Stainless  
Steel Pipe Nipples
  - B32-89..... Solder Metal
  - B61-86..... Steam or Bronze Castings
  - B62-86..... Composition Bronze or Ounce Metal Castings
  - B75-86..... Seamless Copper Tube
  - B88-89..... Seamless Copper Water Tube
  - B152..... Copper Sheet
  - B-819..... Medical Gas Seamless Copper Tube
  - B306-88..... Copper Drainage Tube (DWV)
  - B584-89..... Copper Alloy Sand Castings for General Applications Revision A
  - B687-88..... Brass, Copper, and Chromium-Plated Pipe Nipples
  - C564-88 ..... Rubber Gaskets for Cast Iron Soil Pipe and Fittings
  - D2000-86 ..... Rubber Products in Automotive Applications
  - D2146-82 ..... Propylene Plastic Molding and Extrusion Materials
  - D2447-89 ..... Polyethylene (PE) Plastic Pipe, Schedule 40 and 80, Based on  
Outside Diameter
  - D2564-89 ..... Solvent Cements for Poly (Vinyl Chloride) (PVC) Pipe Plastic Pipe  
and Fittings
  - D2665-89 ..... Poly (Vinyl Chloride) (PVC) Plastic Drain, Waste, and Revision A  
Vent Pipe and Fittings
  - D4101-82 ..... Propylene Plastic Injection and Extrusion Materials
- E. American Water Works Association (AWWA):
- C151-86 ..... Ductile-Iron Pipe, Centrifugally Cast in Metal Molds or Sand-Lined  
Molds, for Water or Other Liquids
  - C203-86 ..... Coal-Tar Protective Coatings and Linings for Steel Water  
Pipelines - Enamel and Tape - Hot Applied
  - C651-86 ..... Disinfecting Water Mains
  - C701-88 ..... Cold Water Meters-Turbine Type, for Customer Service
- F. National Fire Protection Association (NFPA):
- 54-88 ..... National Fuel Gas Code
- G. American Welding Society (AWS):
- A5.8-89..... Filler Metals for Brazing
- H. National Association of Plumbing - Heating - Cooling Contractors (PHCC):
- National Standard Plumbing Code - 2009
- I. Cast Iron Soil Pipe Institute (CISPI):
- 301-85 ..... Hubless Cast Iron Soil and Fittings

- J. International Association of Plumbing and Mechanical Officials (IAPMO):  
Uniform Plumbing Code - 1988  
IS6-82..... Installation Standard
- K. Manufacturers Standardization Society of the Valve and Fittings Industry, Inc. (MSS):  
SP-70-84 ..... Cast Iron Gate Valves, Flanged and Threaded Ends.
- L. American Society of Sanitary Engineers (ASSE):  
1003 ..... Water Pressure Reducing Valves  
1010 ..... Water Hammer Arresters  
1001-70 ..... Pipe Applied Atmospheric Type Vacuum Breakers  
1013-88 ..... Reduced Pressure Principle Backflow Preventers  
1015-88 ..... Double Check Backflow Prevention Assembly  
1020-81 ..... Vacuum Breakers, Anti-Siphon, Pressure Type
- M. Factory Mutual (FM):  
1680-89 ..... Coupling Used in Hubless Cast Iron Systems for Drains, Waste and Vent Systems.

## PART 2 - PRODUCTS

### 2.1 PIPING AND FITTINGS MATERIAL SCHEDULE

- A. Piping systems shall be constructed of the following materials as scheduled below, subject to approval by authorities having jurisdiction.

Systems	Pipe	Fittings	Remarks
Relief valve discharge piping	Type L hard drawn copper tubing w/95-5 tin antimony solder joints	Cast bronze or wrought copper with solder joints	
Soil, waste, vent & storm drainage piping, underground	Serviceweight cast iron, bell & spigot	Cast iron bell and spigot with lead and oakum joints	Min. pipe size 2 inches
	Schedule 40 PVC	Schedule 40 PVC Socketweld	
Soil, waste, vent & storm drainage piping, above ground	Serviceweight cast iron, bell & spigot	Cast iron recessed drainage fittings, with rubber compression gaskets	
	Serviceweight cast iron, no-hub	Cast iron recessed drainage fittings with elastomeric gasket and stainless steel clamps	
	Copper drainage tube, type DWV	Cast brass recessed drainage fittings, with solder joints	Use soil pipe adapter for any connection to cast

Systems	Pipe	Fittings	Remarks
	Schedule 40 PVC	Schedule 40 PVC Socketweld	iron pipes at ground level

### PART 3 - EXECUTION

#### 3.1 GENERAL

- A. The drawings schematically indicate the size and location of piping. Piping system layout shall be modified as required to meet field conditions and facilitate coordination. Piping shall conform to the latest ASA code for pressure piping. Unless otherwise noted, all piping, valves, and associated fittings shall be concealed behind walls, above ceilings, or below floors.
- B. Provide adequate provision for expansion and contraction in portions of the piping systems, to prevent undue strains on piping, building anchor points, and connected equipment.
- C. Piping connections to plumbing fixtures and equipment shall be provided with offsets and shutoff valves arranged such that equipment can be serviced or removed without dismantling the pipe.
- D. Pitch water piping up in direction of flow to ensure adequate flow without air binding and to prevent noise and water hammer. Branch connections to mains shall be made in such a manner as to prevent air trapping and prevent free passage of air. Mains shall be laid out to meet field conditions, maintain adequate headroom and clear work.
- E. Any piping passing through roof construction shall be arranged to provide a minimum of 12 inch clearance from walls or other obstructions so as to permit proper flashing. Set pipe flashing fittings at a suitable level above the roof to permit proper termination of flashing.
- F. Converging or diverging Bullheaded Tee's are not permitted.

#### 3.2 PIPING SYSTEM PRESSURE TESTS

- A. The following procedures shall be observed for piping system pressure tests:
  1. Take all due precautions to prevent damage to the building and its contents that may be incurred by such tests; repair or make good any damage caused by the tests at no additional cost to the Owner.
  2. Tests shall apply full test pressure to the piping for a sufficient period of time to detect leaks and defects. Refer to individual piping testing procedures for approved testing of liquids or gases.
  3. Tests shall be conducted prior to the installation of any required fitting insulation. If delicate control mechanisms, not including control valves, are installed in the piping, they shall be removed to prevent shock damage.
  4. The section of piping to be tested shall be brought up to the specified test pressure. If the test pressure falls more than the specified amount during the test period, the point of leakage shall be found, repaired and the test repeated. This procedure shall be repeated until the piping system has been proved absolutely tight.

5. Leaks shall be repaired by removing the valve, fitting, joint or section that is leaking and reinstalling new materials and joints as specified. Use of mastic of "no-leak" compounds or other temporary means of repairing leaks shall not be permitted.

### 3.3 SANITARY AND STORM WATER, DRAINAGE SYSTEMS

#### A. Installation Procedures

1. Drainage piping 3 inches and larger, unless otherwise indicated shall be pitched at a minimum rate of 1/8 inch per foot in direction of flow. Drainage piping smaller than 3 inches shall pitch at 1/4 inch per foot. Branch connections to stacks or main drains shall not be made in a manner that shall permit backflow.
2. Vent piping shall be arranged to drain any condensate back to drainage piping.
3. Cast iron hub and spigot pipe shall have joints made with elastomeric compression gasket.
4. Screwed joints shall be made with best quality pipe joint compound, carefully placed on the threads of pipe and not on the fittings.
5. Cut and threaded pipe shall have the cutting burrs and sharp edges reamed out.
6. Connections between galvanized steel and cast iron pipe shall be made with elastomeric compression gasket; the end of the galvanized steel pipe shall be fitted with a ring or part of a coupling screwed on to form a spigot.
7. Provide test tees in vertical soil, and leader stacks at required intervals to permit testing in sections, as not to delay work program as a whole.
8. Provide cleanouts at the base of soil lines and at changes in direction of horizontal piping. Distance between cleanouts of horizontal runs shall be the minimum required by Code or 50 feet, whichever is less. Cleanouts shall be made accessible by means of approved deck plates, access panels and doors.
9. Access doors and frames for cleanouts located behind walls shall be furnished for installation by others. A complete list of wall cleanout locations shall be furnished prior to erection of walls.
10. Where cleanouts occur in floors, they shall be compatible with surrounding finished surface.
11. Cleanout plugs shall be lubricated with graphite to facilitate removal. No pipe compound is to be used on plugs.
12. Cleanouts shall be full size of pipe up to 6 inches, and 6 inches for pipes 6 inches and larger.
13. When connecting to existing sanitary system, clean out sanitary from tie-in to next downstream cleanout.

#### B. Sanitary and, Storm Water, System Testing

1. The entire sanitary, soil, and vent system piping shall be subjected to hydrostatic testing comprised of plugging openings in the lines, filling the system (or portion thereof) with water to produce at least a 10 foot head of water at the highest point of the section tested. The water shall be kept in the section tested for at least 15 minutes before inspection starts, and the section tested shall stand without loss of level for the entire duration of the inspection.

2. The interior storm water drainage system shall be tested in accordance with the testing requirements for the sanitary, soil, acid waste, and vent system piping.
3. In the event that the test period occurs during months in which freezing weather may occur, an air test shall be conducted instead of the water tests specified in Section 3.05 B(1), to prevent the possibility of the oakum being saturated with water, freezing, and cracking the cast iron soil pipe at the hub. The air test shall be conducted as follows:
  - a. Attach an air compressor testing apparatus to any suitable opening and, after plugging other inlets and outlets to the system, force air into the system until there is a uniform gauge pressure of 5 psi or sufficient to balance a column of mercury 10 inches in height. This pressure shall be held without the introduction of additional air for a period of at least 15 minutes.
4. Final Test - After all fixtures have been installed and the fixture traps filled with water, a final test of the drainage and vent system should be conducted using either a smoke or peppermint test.
  - 1) Smoke Test - The smoke test shall be made by filling traps with water and then introducing into the entire system a pungent, thick smoke produced by one or more smoke machines. When the smoke appears at stack openings on the roof, they shall be closed and a pressure equivalent to a 1 inch water column shall be built up and maintained for 15 minutes before inspection starts.
  - 2) Peppermint Test - Where the peppermint test is preferred, 2 ounces of oil of peppermint shall be introduced into each line or stack.

END OF SECTION

## **SECTION 223300**

### **DOMESTIC WATER HEATERS**

#### **PART 1 - GENERAL**

##### **1.1 GENERAL**

- A. Provide domestic water heaters and accessories as shown on the drawings and specified herein.

#### **PART 2 - PRODUCTS**

##### **2.1 COMMERCIAL HIGH EFFICIENCY WATER HEATERS**

- A. Domestic Water heaters shall be Bradford White Commercial ef Series or equivalent high efficiency type and shall have PVC flue and combustion air venting. Unit shall have efficiency of 98.1% .
- B. Water heater shall tank lined with an Vitraglas enamel and shall have non-cfc insulated jacket to permit zero inch clearance to combustibles. Unit shall multiple magnesium anode rods and shall have hand hole cleanout to inspect and clean tank interior.
- C. Water heater shall have 100 gallon storage capacity with 300.00 MBH natural gas burner and shall have a recovery of 335 GPH @ 100 degree F rise.
- D. Unit shall have a direct spark ignition with a pre-mix power burner that shall automatically increase or decrease fuel flow when a change in combustion air is detected.
- E. Water heater shall have digital display having the capability of adjusting the degree setting.
- F. Unit shall be complete with 1 inch drain valve, properly sized pressure and temperature relief valve, temperature limiting device, and concentric vent kit to permit one exit opening through wall or roof.
- G. Entire unit shall have a one-year warranty from start-up and shall carry 5-year tank warranty.

##### **2.3 PRESSURE AND TEMPERATURE RELIEF VALVE**

- A. Pressure and temperature relief valves shall be Watts ASME rated automatic reseating temperature and pressure relief valves of bronze body construction with test lever. Model number and size to be based on heater size.

##### **2.4 EXPANSION TANK**

- A. Description: steel, pressure-rated tank constructed with welded joints and factory-installed, butyl-rubber bladder. Include air pre-charge to system-operating pressure at tank.
- B. Construction: The tank must be constructed in accordance with Section VIII of the ASME boiler and pressure vessel code and stamped 150 psig working-pressure rating.
- C. Tappings: Factory-fabricated steel, welded to tank before testing and labeling. Include ASME B1.20.1 pipe thread.
- D. Tank Interior Finish: Materials and thickness complying with NSF 61, barrier materials for potable-water tank linings. Extend finish into and through tank fittings and outlets.



- E. Tank Exterior Finish: Manufacturer's standard, unless finish is indicated.
- F. Air-Charging Valve: Factory installed.
- G. Products: Wessels Series TTA  
Taco Series PAX  
B& G Series PTA

## PART 3 - EXECUTION

### 3.1 GENERAL

- A. Install water heaters in accordance with manufacturer's recommendations.
- B. Verify proper operation of water heater and controls. Record outlet temperature at tank outlet and downstream of mixing valve. Verify proper operation of the recirculation pump.

END OF SECTION

## SECTION 224000

### PLUMBING FIXTURES AND TRIM

#### PART 1 - GENERAL

##### 1.1 GENERAL

- A. Provide plumbing fixtures as indicated on the drawings and specified herein. Lavatory accessories shall conform to requirements of the International Energy Conservation Code.
- B. For fixtures not provided with traps, provide an adjustable chrome-plated P-trap of the same size as fixture tailpiece or 1-1/2 inch whichever is greater. Traps shall be Eljer drain trap 804 with 17 gauge tubing outlet with wall flange and slip joint inlet. Exposed piping, fittings, escutcheons, valves, etc. shall be chrome-plated metals. Exposed metal on fixtures shall be chrome-plated brass.
- C. Exposed piping, fitting escutcheon, valves, etc. shall be chrome-plated metals. Exposed metal on fixtures shall be chrome-plated brass.
- D. Unless required otherwise by ADA of 1992, mounting heights shall be verified and coordinated by the Owner. Mounting heights when listed are suggested heights only.
- E. All faucet finishes shall be polished chrome unless otherwise noted.
- F. All faucets shall be certified lead-free.

#### PART 2 - PRODUCTS

##### 2.1 PLUMBING FIXTURES

- A. Plumbing fixtures shall be as manufactured by American Standard, Kohler, or Eljer, unless otherwise indicated. Faucets and trim shall be as manufactured by Chicago Faucets, American Standard, T&S Brass, Crane, and Eljer unless otherwise specified. Plate numbers are provided below to indicate type and standard of quality of fixtures to be provided:
  - 1. Water Closets (WC-1)
    - Floor Mounted with Flush Tank
    - American Standard Cadet 2462.016, elongated rim, floor mounted pressure assisted with bolt caps, 1.6 gallon/flush, with 5901.100SS seat.
  - 2. Handicapped Water Closets (WC-1A)
    - Floor Mounted with Flush Tank
    - American Standard Cadet 2467.016, elongated rim, floor mounted pressure assisted with bolt caps, 1.6 gallon/flush, 18" high, with 5901.100SS seat.
  - 3. Urinals (UR)
    - a. American Standard Lynbrook 6601.012, vitreous china blowout urinal, wall hung, 1-1/4" top spud with Sloan #180 flush valve.
    - b. Handicapped  
Mount as required for handicapped.

6. Lavatory Trim

- a. American Standard Heritage deck type faucet combination with aerator and pop-up drain.
- b. Faucet Symmons Symmetrix single handle, centerset faucet Model S-20-0-1.5.
- c. Handicapped Installation – Insulate waste and domestic hot water under sink.

7. Shower Trim

- a. Powers pressure balance diaphragm operation, anti-lime, adjustable limit stop and lever handle, inlet check stops.
- b. Showers: Powers P905HM2.
- c. Handicap Shower: Powers P905H7W.
- d. Provide shower drain and cast brass strainer in field fabricated shower.

8. Mop Service Basin

- a. Fiat molded stone mop service basin with #830-A supply fitting and #8899CC Mop Hanger.

9. Hand Sink

- a. Advance Tabco 7-ps-45 stainless steel hand sink with faucet.

10. Kitchen Sink Trim

- a. T&S Brass, Gooseneck, Pre-rinse, manual faucet activation, 1.42GPM, model # B-2187.

2.2 FLOOR DRAINS (FD)

- A. Zurn Z-415 drains with Type B strainer. In areas with finished floors, provide stainless steel top; otherwise, provide polished bronze top.

2.3 FITTINGS FOR FIXTURES SUPPLIED BY OTHERS

- A. Provide trap, tailpiece, and supply pipes as specified in Paragraph 1.1, General, of this section.

PART 3 - EXECUTION

3.1 GENERAL

- A. Install and connect fixtures in a secure, true, plumb and symmetrical manner. Thoroughly clean each fixture after installation and leave in proper working order, absolutely solid in their respective positions. For sinks and lavatories, verify clockwise rotation for cold water stem and counterclockwise rotation for hot water stem while facing respective stems.

- B. Water supply piping serving flush valves for water closets, urinals and associated accessories shall be securely anchored within the construction at each exit point to ensure that flush valves, equipment and accessories shall be absolutely rigid with no movement in supply pipes. Movement in fixtures shall be sufficient cause for rejection.
- C. When fixture trim is completed, adjust stops to provide proper flow through each valve or faucet.
- D. Each fixture shall be filled with water and checked for leaks and retarded drainage.
- E. Flush valves, loose key or wheel handle stops, valves and similar devices shall be adjusted and balanced to provide first class operation of the various systems.
- F. Floor-mounted fixtures shall not be installed until finished floor is in place.
- G. Where any plumbing fixture comes in contact with the wall, seal with a non-shrink, mildew-resistant caulking.
- H. Provide waterproofing of floor drains as required by local codes. Flashing material shall be approved by local codes. Flashing material shall extend a minimum of 18 inches from the center of the floor drain in all directions.
- I. Installation of handicap shall meet requirements of Americans with Disabilities Act.
- J. Provide final connection and install fixtures and equipment furnished by others.

END OF SECTION

**SECTION 224216**  
**SINGLE PIECE LAVATORIES**

**PART 1 - GENERAL**

**1.1 SECTION INCLUDES**

1. Commercial lavatory faucets.

**1.2 RELATED SECTIONS**

1. Division 22 - Plumbing

**1.3 REFERENCES:**

- A. American Society of Sanitary Engineering (ASSE):
  1. ASSE 1070 - Water Temperature Limiting Devices.
- B. American Society of Mechanical Engineers (ASME):
  1. ASME A112.18.1 Plumbing Supply Fittings.
  2. ASTM D 570 - Standard Test Method for Water Absorption of Plastics.
  3. ASTM D 785 - Standard Test Method for Rockwell Hardness of Plastics and Electrical Insulating Materials.
  4. ASTM D 790 - Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.
  5. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
- C. International Association of Plumbing and Mechanical Officials (IAPMO):
  1. Universal Plumbing Code (cUPC both U.S. and Canada).
- D. International Code Council (ICC):
  1. ICC/ANSI A117.1 – Accessible and Usable Buildings and Facilities.
- E. National Fire Protection Association (NFPA):
  1. NFPA 70 – National Electrical Code.
- F. Underwriters Laboratories, Inc. (UL):
  1. UL 723 - Test For Surface Burning Characteristics of Building Materials.
  2. UL 1951 - Electric Plumbing Accessories.
- G. US Federal Government:
  1. Public Law 102-486 - Energy Policy Act. 1992 (EPACT).
  2. U.S. Architectural & Transportation Barriers Compliance Board. Americans with Disabilities Act (ADA), Accessibility Guidelines for Buildings and Facilities (ADAAG).

**1.4 ACTION SUBMITTALS**

- A. Product Data: Manufacturer's data sheets, installation instructions, and maintenance recommendations.
- B. Product Test Reports: Indicating compliance of products with requirements, from a qualified independent testing agency, when requested by Architect.

- C. Shop Drawings: Prepared by manufacturer. Include mounting and rough-in requirements and power, signal, and control wiring diagrams. Include details of electrical and mechanical operating parts.

#### 1.5 INFORMATION SUBMITTALS

- A. Sample warranty.
- B. Manufacturer's Certificates.
- C. Indoor environmental quality certificates.

#### 1.6 MAINTENANCE SUBMITTALS

- A. Operation, maintenance and cleaning data.

#### 1.7 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Approved manufacturer listed in this section, with minimum [5] years experience in the manufacture of plumbing fixtures. Manufacturers seeking approval must submit the following:
  - 1. Product data, including test data from qualified independent testing agency indicating compliance with requirements.
  - 2. Samples of each component of product specified.
  - 3. List of successful installations of similar products available for evaluation by Architect.
  - 4. Submit substitution request not less than 15 days prior to bid date.
- B. Source Limitations: Obtain each type of plumbing fixture and compatible accessories through one source from a single approved manufacturer.
- C. Accessibility Requirements: Comply with requirements of ADA/ABA and with requirements of authorities having jurisdiction.
- D. Water Flow and Consumption Requirements: Comply with EPACT.
- E. Drinking Water Standard: Comply with NSF/ANSI 372.
- F. Electrical Components: Listed and labeled per NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction.

#### 1.8 COORDINATION

- A. Field Measurements: Verify locations of lavatory decks and adjacent walls prior to fabrication.

#### 1.9 WARRANTY

- A. Special Manufacturer's Warranty: Provide manufacturer's standard form in which manufacturer agrees to repair or replace commercial lavatory decks that fail in materials or workmanship.
  - 1. Solid surface material: 10 years.
  - 2. Faucets: 1 year.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide commercial lavatory decks and faucets manufactured by Bradley Corporation, Menomonee Falls, WI 53051, (800)272-3539, fax (262)251-5817; Email [info@BradleyCorp.com](mailto:info@BradleyCorp.com); Website [www.bradleycorp.com](http://www.bradleycorp.com).
1. Submit requests for substitution in accordance with Instructions to Bidders and Division 016000.

### 2.2 MATERIALS

- A. **Solid Surface Material:** Where indicated as constructed of solid surface material, fabricate plumbing fixtures from thermoset modified bio-based resin certified by approved independent testing agency as complying with CSA B45.5/IAPMO Z124, with the following minimum properties:
1. Basis of Design Product: Bradley, **Terreon**.
  2. Thickness: 1/2 inch (13 mm), minimum.

### 2.3 LAVATORY DECKS, SINGLE STATION

- A. ADA/ABA Compliant Wall-Mounted, Single-Station Lavatory Fixture: With integral bowl, water overflow and ledged back, drain, strainer, and tailpiece.
1. Basis of Design Manufacturer/Model: Bradley, OmniDeck Model LD-3010-1 Terreo.
  2. Material: Solid surface material.
  3. Deck Edge Accessories: Solid surface integral coved backsplash, Side splashes, Front apron, Side aprons.
  4. Deck Nosing: 3/8 inch (9.5 mm) radiused.
  5. Access Panel: Stainless steel.
  6. Mounting: Stainless steel mounting brackets.
  7. Overall Single-Station Unit Size: 30 by 22 inch (762 by 559 mm).
  8. Deck Colors: As selected by Architect from manufacturer's full line.
  9. Integral Molded Lavatory Bowl for Solid Surface Decks:
    - a. Bowl Material and Size: HS-TO1 solid surface material, oval 22 by 14 inch (558 by 355 mm)
    - b. Color: As selected by Architect from manufacturer's full line of solid surface colors.
  10. Faucet: As indicated in Section 224000.
  11. Water Supply: Thermostatic mixing valve assembly, with single point rough-in for unit.
  12. Waste Hookup: Single point rough-in for unit.

## 2.4 LAVATORY DECKS, MULTIPLE STATION

- A. ADA/ABA Compliant Wall-Mounted, Multiple-Station Lavatory Fixture: With integral bowls, drain, strainer, and tailpiece.
1. Basis of Design Manufacturer/Model: Bradley, OmniDeck Model [LD-3010 Terreon].
  2. Material: Solid surface material.
  3. Configuration: 2 and 3 station deck.
  4. Deck Edge Accessories: Solid surface integral coved backsplash, Side splashes, Front apron, Side aprons.
  5. Deck Nosing: 3/8 inch (9.5 mm) radiused.
  6. Access Panel: Stainless steel.
  7. Mounting: Stainless steel mounting brackets.
  8. Overall Unit Size: 60 by 24 inches (1524 by 610 mm) with 2 bowls. 90 by 24 inches (2286 by 610 mm) with 3 bowls.
  9. Deck Colors: As selected by Architect from manufacturer's full line.
  10. Integral Molded Lavatory Bowl for Solid Surface Decks:
    - a. Bowl Material and Size: HS-TO1 solid surface material, oval 22 by 14 inch (558 by 355 mm)
    - b. Color: As selected by Architect from manufacturer's full line of solid surface colors.
1. Faucet: As indicated in Section 224000.
  2. Water Supply: Thermostatic mixing valve assembly, with single point rough-in for unit.
  3. Waste Hookup: Single point rough-in for unit.

## 2.5 FAUCET ACCESSORIES

1. **Thermostatic Mixing Valve:** Lead-free thermostatic mixing valve, ASSE 1070 listed, with glass-filled polysulfone valve body, thermoplastic polymer cartridge, and integral check valves and strainers.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine conditions and verify opening measurements prior to commencing installation. Proceed with installation once conditions meet requirements.

### 3.2 INSTALLATION

- A. Assemble fixtures and associated fittings and trim in accordance with manufacturer's instructions.
- B. At time of Substantial Completion:
1. Clean unit surfaces per manufacturer's care instructions, test fixtures and leave in ready-to-use condition.
  2. Install new batteries in battery operated devices.
  3. Fill soap dispensers.



4. Turn over keys, tools, maintenance instructions and maintenance stock to Owner.
  - C. Install Single-Point Connections:
    1. Install water supply piping to unit. Provide stop on each supply in readily-serviced location. Fasten supply piping to supports or substrate.
    2. Install trap and waste piping to unit.
  - D. Install escutcheons at exposed piping penetrations in finished locations and within cabinets.
  - E. Seal joints between fixtures and walls, floors, and countertops with joint sealant specified in Division 07 Section "Joint Sealants."
- 3.3 CLEANING AND PROTECTION
- A. Repair or replace defective work, including damaged fixtures and components.
  - B. Clean unit surfaces, test fixtures, and leave in ready-to-use condition.
  - C. Install new batteries in battery-operated devices at time of Substantial Completion.
  - D. Turn over keys, tools, maintenance instructions, and maintenance stock to Owner.
  - E. Protect units with water-resistant temporary covering. Do not allow temporary use of plumbing fixtures unless approved in writing by Architect. Remove protection at Substantial Completion and dispose.
- 3.4 TESTING AND ADJUSTING
- A. Set field-adjustable temperature set points of temperature-actuated water mixing valves. Adjust set point within allowable temperature range.
  - B. Test and adjust installation.
  - C. Remove and replace malfunctioning thermostatic mixing valves and retest.

END OF SECTION

## SECTION 230500

### GENERAL HVAC PROVISIONS

#### PART 1 - GENERAL

##### 1.1 REFERENCE TO CONDITIONS OF THE CONTRACT

- A. The Conditions of the Contract (General, Supplementary and other Conditions) and Division 1 - General Requirements, apply to the work specified in Division 23. Unless the specifications contain statements which are more definitive or more restrictive than those contained in the Conditions of the Contract, the specifications shall not be interpreted as waiving or overruling any requirements expressed in the Conditions of the Contract.

##### 1.2 SCOPE OF WORK

- A. The scope of the work included under Division 23 of the specifications shall include complete mechanical systems as shown in the Contract Documents and specified herein. Any work reasonably inferable or required to result in a complete installation or the intended operation and performance of the systems, shall be included in the Base Bid except where there is specific reference to exclusion and incorporation in other quotations.

##### 1.3 INTENT OF DRAWINGS

- A. Provide a complete mechanical system for the proposed project. The mechanical system provided shall conform to the details stated in the specifications and shown on the drawings. Items or work not shown or specified, but required for a complete mechanical system, shall be provided and shall conform with accepted trade practices. The drawings and specifications are presented to define specific system requirements and serve to expand on the primary contract requirements of providing a complete mechanical system. The drawings are diagrammatic and indicate only the general arrangement of the items comprising the several systems included in the mechanical work.
- B. Do not scale the drawings. Because of the scale of the drawings, it is not possible to indicate offsets, fittings, valves, or similar items which may be required to make a complete operating system. Carefully investigate conditions affecting work and install work in such a manner that interferences between pipes, conduit, ducts, equipment, and architectural and structural features shall be avoided and shall provide items that may be required to meet the conditions at the building, without additional cost to the Owner.
- C. Bidders shall have sufficient expertise in this type of construction to realize the extent of the work required.
- D. It should, therefore, be obvious to any prudent firm with experience in this field that these documents may not explicitly disclose final details; however, the firms offering proposals are represented to possess the expertise necessary to include necessary appointments.

##### 1.4 DEFINITIONS

- A. Specific terminology, as used herein, shall have the following meanings:

1. "Furnish"...Supply and deliver to project site, ready for unloading, unpacking, assembly, installation, and similar subsequent requirements.
2. "Install"...Operations at project site, including unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar requirements.
3. "Provide"...Furnish and install, complete and ready for intended use.
4. "Piping"...Pipe, fittings, flanges, valves, controls, hangers, traps, drains, insulation, vents and other items customarily required in connection with the transfer of fluids.
5. "Concealed"...Embedded in masonry or other construction, installed behind wall furring, within double partitions or hung ceilings, in crawl spaces or shafts.
6. "Exposed"...Not concealed.
7. "Conditioned"...Spaces directly provided with heating and cooling.
8. "Unconditioned"...Spaces without heating or cooling including ceiling plenums.
9. "Indoors"...Located inside the exterior walls and roof of the building.
10. "Outdoors"...Located outside the exterior walls and roof of the building.

B. Reference to the following codes and standards shall mean:

<u>Reference</u>	<u>Definition</u>
ASTM	American Society for Testing Materials
NFPA	National Fire Protection Association
UL	Underwriters Laboratories, Inc.
NEMA	National Electrical Manufacturers Association
USAS	United States of America Standards Institute
ANSI	American National Standards Institute
FS	Federal Specification, US Government
CS	Commercial Standards issued by US Department of Commerce
MSS	Manufacturers Standardization Society of the Valve and Fitting Industry
ASHRAE	American Society of Heating, Refrigeration and Air Conditioning
Engineers	
SMACNA	Sheet Metal and Air Conditioning Contractors National Association
ARI	Air Conditioning and Refrigeration Institute
ADA	Americans with Disabilities Act
AMCA	Air Movement and Control Association

C. References to codes, standards, manufacturer's information, etc. are the latest publication in effect during the bid period.

## 1.5 GENERAL STANDARDS OF MATERIALS

- A. Equipment and materials, unless specifically indicated otherwise, shall be new and of first quality, produced by manufacturers who have been regularly engaged in the manufacture of these products for a period of not less than five years.
- B. Equipment of one type shall be the products of one manufacturer; similar items of the same classification shall be identical, including equipment, assemblies, parts and components.

- C. Materials furnished shall be determined safe by a nationally recognized testing organization, such as Underwriters' Laboratories, Inc., or Factory Mutual Engineering Corporation, and materials shall be labeled, certified or listed by such organizations.
- D. With respect to custom made equipment or related installations which are constructed specially for this project, the manufacturer shall certify the safety of same on the basis of test data. The Owner shall be furnished copies of such certificates.
- E. All products provided shall meet flame spread and smoke spread ratings of 25/50.

#### 1.6 PRODUCTS AND SUBSTITUTIONS

- A. Where several manufacturers' products are specified, the bid shall be based upon the specified products only. Proposed substitutions will be considered if received 5 days before the bid date and in accordance with Division 1 requirements.
- B. Note that where only one manufacturer's product is specified, the associated systems have been designed on the basis of that product. Where several manufacturer's products are specified, the associated systems have been designed on the basis of the first-named manufacturer's product. When products other than those used as the basis of design are provided, pay additional costs related to modifications to the systems and/or structure required by the use of that product.
- C. It is the intent of these specifications that service organizations such as balancing agencies follow the above substitution procedures.

#### 1.7 CODES, PERMITS AND INSPECTIONS

- A. Materials furnished and work installed shall comply with the International Mechanical Code, with the International Energy Conservation Code, with the National Fire Codes of the National Fire Protection Association, with the requirements of the local utility companies, and with the requirements of governmental departments or authorities having jurisdiction. Materials and equipment furnished for the electrical portion of the mechanical systems shall bear the approval label of or shall be listed by the Underwriters' Laboratories, Inc. Electrical work shall comply with the National Electrical Code.
- B. Provide labor, materials, services, apparatus and drawings required to comply with applicable laws, ordinances, rules and regulations, whether or not shown on the drawings and/or specified.
- C. Provide labor, materials, services and apparatus required for the performance and pressure tests specified hereinafter. Final tests shall be conducted in the presence of the Architect (Engineer) and inspectors of authorities having jurisdiction, who shall be notified, in writing, at least 48 hours in advance of same. Ensure that the work shall stand the final test prior to giving the notification. Should the work fail the final test, necessary corrections shall be made and the work shall be re-submitted for testing and inspection. The cost of the Architect's additional time, travel expenses, and other applicable expenses due to the re-testing shall be included.
- D. Obtain and pay for required permits.

#### 1.8 GUARANTEES AND CERTIFICATES

- A. Where materials or equipment are specified to comply with requirements of the Underwriters' Laboratory, Inc., the American Refrigeration Institute, the American Society of Mechanical Engineers, or similar technical groups or societies having

jurisdiction over the type and design of particular mechanical or electrical equipment specified herein, proof of such compliance shall be submitted. The label or listing of the specified agency shall be acceptable evidence. In lieu of a label or listing, a written certificate may be submitted from an approved, nationally recognized testing organization equipped to perform such services, stating that the items have been tested and conform to the requirements and testing methods of the specified agency. Where equipment is specified to conform to requirements of the ASME Boiler and Pressure Vessel Code, the design, fabrication and complete installation shall conform to that code.

1. Certification shall be submitted attesting to the fact that the specified performance criteria are met by items of equipment.
2. Work shall be guaranteed to be free from leaks or defects. Any defective equipment, materials or workmanship, including damage to the work provided under other divisions of this contract resulting from same, shall be replaced or repaired at no extra cost to the Owner for the duration of the stipulated guarantee periods.
3. Unless specifically indicated otherwise, the duration of the guarantee period shall be one (1) year following the date of final acceptance by the Owner. Owner acceptance will begin with actual occupancy of the areas served by this equipment. Temporary operation of the equipment for temporary conditioning, testing, etc., prior to occupancy will not be considered part of the warranty period.

#### 1.9 QUIET OPERATION AND VIBRATION CONTROL

- A. Equipment and associated items shall operate under conditions of load without sound or vibration deemed objectionable by the Architect (Engineer). In the case of moving equipment, sound or vibration noticeable outside of the room in which it is installed, or annoyingly noticeable within the room in which it is installed, shall be deemed objectionable. Sound or vibration deemed objectionable shall be corrected in an approved manner at no extra cost to the Owner. Vibration control shall be provided by means of approved vibration isolators and installed in accordance with the isolator manufacturer's recommendations.
- B. The sound pressure levels around mechanical and electrical equipment (fans, pumps, motors, etc.) in equipment spaces shall not exceed 85 dBA at any point three (3) feet from the equipment, with all equipment in the room operating. The sound criteria applies to the complete range of each piece of equipment.

#### 1.10 COORDINATION

- A. Coordinate and furnish in writing to the Architect (Engineer) any information necessary to permit the work to be installed satisfactorily and with the least possible interference or delay.
- B. Devices and appurtenances which are to be installed in finished areas shall be coordinated with the Architect for final approval as it relates to location, finish, materials, color and texture.
- C. When work is installed without proper coordination, changes to this work deemed necessary by the Architect shall be made to correct the conditions without extra cost to the Owner.

### 1.11 ACCESSIBILITY

- A. Coordinate to ensure the sufficiency of the size of shafts and chases, and the adequacy of clearances in hung ceilings and other areas required for the proper installation of this work.
- B. Locate equipment which must be serviced, operated or maintained in fully accessible positions. Locations in ceilings requiring access shall be coordinated with, but not limited to, lights, curtain tracks, speakers, and medical gas tracks. Equipment requiring access shall include, but is not necessarily limited to, valves, traps, clean-outs, motors, fire dampers, controllers, switchgear and drain points.
- C. Provide drawings for coordination, as required, showing exact locations of access doors for each concealed valve, control, damper, or other device concealed behind finished construction and requiring service. Equipment (valves, RTC) below floor slab or finished grade shall be considered as finished construction. Access doors in finished construction shall be furnished as specified in this section. Locations of access doors in finished construction shall be submitted in sufficient time to be installed in the normal course of the work.

### 1.12 ACCESS DOORS

- A. Manufacturers: Subject to compliance with requirements, furnish access doors by one of the following:
  - 1. Bar-Co., Inc.
  - 2. J. L. Industries
  - 3. Karp Associates, Inc.
  - 4. Nystrom, Inc.
- B. Materials and Fabrication:
  - 1. General: Furnish each access door assembly manufactured as an integral unit, complete with all parts and ready for installation.
  - 2. Steel Access Doors and Frames: Fabricate units of continuous welded steel construction, unless otherwise indicated. Grind welds smooth and flush with adjacent surfaces. Furnish attachment devices and fasteners of type required to secure access panels to types of support shown.
  - 3. Frames: Fabricate from 16-gauge steel.
    - a. Fabricate frame with exposed flange nominal 1 inch wide around perimeter of frame for units installed in the following construction:
      - 1) Exposed Masonry
    - b. For gypsum drywall or veneer gypsum plaster, furnish perforated frames with drywall bead.
    - c. For installation in masonry construction, furnish frames with adjustable metal masonry anchors.
    - d. For full-bed plaster applications, furnish frames with galvanized expanded metal lath and exposed casing bead, welded to perimeter of frame.

4. Flush Panel Doors: Fabricate from not less than 14-gauge sheet steel, with concealed spring hinges or concealed continuous piano hinge set to open 175°. Finish with manufacturer's factory-applied prime paint.
    - a. For fire-rated units, provide manufacturer's standard insulated flush panel/doors, with continuous piano hinge and self-closing mechanism.
  5. Locking Devices: Furnish flush, screwdriver-operated cam locks of number required to hold door in flush, smooth plane when closed.
  - C. Furnish access doors under this division for installation by General Contractor. Coordinate during bidding phase with General Contractor.
- 1.13 ELECTRICAL CONNECTIONS
- A. Regardless of voltage, provide temperature control wiring, interlock wiring, and equipment control wiring for the equipment provided under this division of the specifications.
  - B. Furnish electrical disconnect switches, starters and combination starter disconnects required for equipment provided under this division of the specifications.
  - C. Power wiring not used for control functions, complete from power source to motor or equipment junction box, including power wiring through starters, shall be provided under Division 16.
  - D. Coordinate to ensure that electrical devices furnished or provided are compatible with the electrical systems used.
  - E. Furnish circuit breakers rated for motor protection (for installation under Division 16) for equipment purchased under this division of the specification.
- 1.14 SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES
- A. Shop drawings, product data, and samples shall be submitted in accordance with the provisions of Division 1 - General Requirements.
  - B. The following shall be submitted by the Contractor for review by the Architect:
    1. Scale shop drawings indicating insert and sleeve locations.
    2. Scale shop drawings showing piping and duct runs with sizing indicated.
    3. Product data, factory assembly shop drawings, and field installation shop drawings as required for a complete explanation and description of items of equipment, including appurtenances and accessories. Product data for pumps, fans and similar equipment shall include performance curves illustrating equipment performance characteristics under the specified range of operating conditions.
    4. Samples of finishes and trim exposed to view, such as cleanout plates, fixture trim, escutcheon plates and similar items.
    5. Product data for plumbing fixtures, trim, hangers, and miscellaneous plumbing materials.
    6. Product data for piping inserts, rods, hangers, anchors, guides and trapezes.
    7. Shop drawings locating piping anchor and guide points and expansion joints or loops.

8. Shop drawings locating access doors in sheet metal work.

#### 1.15 OPERATING AND MAINTENANCE INSTRUCTIONS

- A. After final tests and adjustments have been completed, furnish the services of qualified personnel to fully instruct representatives of the Owner in the operation and maintenance procedures for equipment installed including cooling plant, heating plant, air systems, plumbing systems. Operation and maintenance instructions for major items of equipment shall be directly supervised by the equipment manufacturer's representative. Supply qualified personnel to operate equipment for sufficient length of time as required to meet governing authorities' operation and performance tests and as required to assure that the Owner's representatives are properly qualified to take over operation and maintenance procedures. Minimum instruction period shall be 30 man hours. The instruction period shall be broken into segments at the discretion of the Owner.
1. Notify the Architect, the Owner's representative and equipment manufacturers' representatives, by letter, as to the time and date of operating and maintenance instruction periods approved by the Owner at least one (1) week prior to conducting same.
  2. Forward to the Architect the signatures of all those present for the instruction periods.
- B. Furnish three (3) copied of recommended equipment operation and maintenance procedures manuals as specified herein, assembled and bound together in 8-1/2 x 11 inch three-ring binders. The binders shall be submitted to the Architect in accordance with procedures established for shop drawing submittals in Division 1 - General Requirements.
1. The operation and maintenance procedures manuals shall include the following:
    - a. Project title
    - b. Architect's name and address
    - c. Date submitted
    - d. Contractor and subcontractors' name and address
    - e. Index (in alphabetical order, with page numbers)
    - f. General description of each system
    - g. Parts list, identifying the various parts of equipment for repair and replacement purposes.
    - h. List of spares recommended for normal service requirements.
    - i. Edited operating instructions outlining step-by-step procedures required for system start-up and operation. The instructions shall include the manufacturer's name, model number, service manual, and brief description of each piece of equipment and its basic operating features.
    - j. Maintenance instructions describing routine maintenance and lubrication procedures and schedules, and simplified diagrams which illustrate the systems as installed. Instructions as described above shall be tailored for each specific system.



- k. Wiring and control diagrams for each piece of equipment, showing "as installed" conditions.
- l. Performance curves for pumps, fans and similar equipment.
- m. One (1) reviewed copy of each shop drawing submitted.

#### 1.16 SINGULAR NUMBER

- A. References made to any item in the singular number shall apply equally to as many identical items that the work may require.

#### 1.17 PROTECTION OF SERVICES

- A. Repair, replace and maintain in service any new or existing utilities, facilities or services (underground, overground, interior or exterior) damaged, broken or otherwise rendered inoperative during the course of construction. The method used in repairing, replacing or maintaining the services shall be approved by the Owner and Architect.

#### 1.18 PROTECTION OF FLOORS

- A. Protect existing flooring from damage during the construction period. Provide plywood or similar material under equipment or materials stored on floors, and in areas where construction may damage the floor surfaces. Replace floor surfaces (including sealer) damaged during the construction.

#### 1.19 SPECIAL TOOLS

- A. Provide the Owner's representative with two (2) sets of special tools required for operation and maintenance of equipment provided.

#### 1.20 REVIEW BY ARCHITECT/ENGINEER

- A. Notify the Architect/Engineer at least 48 hours in advance of the date and time of tests specified to be witnessed by the Engineer. The Architect/Engineer reserves the right to demand repetition of any testing where he is unable to attend due to insufficient notice without additional cost to the owner.

#### 1.21 PRE-BID SITE VISIT

- A. Bidders shall visit the site and become completely familiar with existing conditions prior to submitting their bid. No extra charges shall be allowed as a result of existing conditions.

### PART 2 - PRODUCTS

#### 2.1 MATERIALS AND WORKMANSHIP

- A. Equipment shall be so built and installed as to deliver its full rated capacity at the efficiency for which it was designed. Equipment shall meet the detailed requirements indicated, and shall be suitable for the installation shown.
- B. Where two or more units of the same class of equipment are furnished in same Section of Specifications, provide each from the same manufacturer. Furnish equipment and

materials new and free from defects of size, make, type and quality herein specified, or as reviewed. Work shall be installed in a neat and workmanlike manner.

- C. Capacities, dimensions, or sizes specified or indicated are minimum, unless otherwise stated. Tolerances used in rating or testing standards specified shall not be allowed in determining capacities of equipment.
- D. Materials shall be listed by the Underwriters' Laboratories, Inc. where applicable and shall be manufactured in accordance with applicable standards established by ANSI, NEMA, ASTM, and IEEE.
- E. Any products judged not in accordance with the Specifications either before or after installation shall be rejected.
- F. Where products are specified with no reference to a particular manufacturer's product, the product used shall meet or exceed industry construction and testing procedure standards applicable to the product, for life expectancy, performance and safety.
- G. Where electrical products are a fabricated assembly, the fabricator shall assume responsibility for correct operation of the entire assembly and of its individual components.
- H. Tools: Provide special tools for proper operation and maintenance of the equipment.

## 2.2 ANCHOR BOLTS

- A. Provide and set in place, at the time of pouring of concrete foundations, necessary anchor bolts as required for the equipment called for under these specifications. Anchor bolts shall be of the hook type, of proper size and length to suit the equipment. Anchor bolts shall be set in pipe sleeves of approximately twice the bolt diameter and one half the embedded length of the bolt. Assume full responsibility for proper emplacement of the bolts.

## 2.3 INSERTS

- A. Provide inserts of an approved metallic type for hangers. Where two or more parallel conduits are installed, continuous inserts may be used. Where required to distribute the load on the inserts, a piece of reinforcing steel of sufficient length shall be passed through the insert.

## 2.4 SLEEVES

- A. Provide sleeves in all roofs, floors, and any fire-rated walls. Each sleeve shall extend through its respective floor, wall or partition and shall be cut flush with each surface unless otherwise required.
- B. Sleeves in bearing and masonry walls, floors and partitions shall be standard weight steel pipe finished with smooth edges. For other than masonry partitions, through suspended ceilings, and for concealed vertical piping, sleeves shall be No. 22 USG galvanized iron.
- C. Sleeves shall be properly installed and securely cemented in place.
- D. Floor sleeves shall extend 1 inch above the finished floor, unless otherwise noted. Space between floor sleeves and passing conduit shall be caulked with graphite packing and waterproof caulking compound.

- E. Sleeves through exterior walls below grade shall have the space between conduit and sleeve caulked watertight using an approved method.

## 2.5 FIREPROOFING

- A. Where sleeves or other penetrations pierce floors or walls having specific fire ratings, the space between the sleeve and passing conduit shall be fireproofed using 3M Series 7900 Penetration Fire Stop putty. Where a cable tray passes through fire-rated walls, use seal bags as manufactured by International Protection Coatings Company. Installation method shall be per manufacturer's recommendations and approved by the Architect/Engineer.

## 2.6 MISCELLANEOUS METAL AND STRUCTURAL STEEL

- A. Scope of Work: Furnish labor, materials, equipment and services necessary for the installation of miscellaneous metal and structural steel work required to complete this contract. Erect structural steel required for the proper support of equipment required under this contract.
- B. Supports, brackets, and clamps and other items specified herein shall be installed in strict accordance with the best practices and recognized code.
- C. Materials: Structural steel members required under this part shall conform to ASTM Standard Specification A-7. Other materials shall be as specified hereinafter.
- D. Priming: steel and iron work shall be primed with Rust-Oleum 769 or approved equivalent. Before priming, metal shall be thoroughly cleaned free from scale, rust and dirt.
- E. Anchors: Provide anchors, bolts, screws, dowels and connecting members, and do cutting and fitting necessary to secure the work to adjoining construction. Build in connecting members to masonry, concrete and structural steel as the work progresses.
- F. Supports and Brackets: shall be neatly constructed to structural shapes to adequately support the equipment intended. Supports must be approved prior to installation. Attention is directed to the proper rigid support required for conduit. Field conditions shall regulate the type of support required.

## 2.7 VIBRATION ISOLATION MOUNTS

- A. Provide vibration isolation mounts for all substations, power centers, transformers, etc. All vibration isolation mounts shall be Amber-Booth spring type applicable for the size and weight of the equipment.

## 2.8 GRADING, FERTILIZING, AND SEEDING

- A. Provide labor, materials, equipment, and services required to strip and store topsoil, replace topsoil, and rough and finish grade and fertilize and seed areas disturbed beyond the work area of the General Contract. Topsoil must be stored where directed on the site.

## 2.9 BITUMINOUS PAVING

- A. Provide labor, materials, equipment, and services necessary to repair pavements disturbed under the Contract.

- B. Materials, methods, and workmanship shall conform with the requirements of the PA Department of Highways, as published in its specifications Form 408, as amended to date.
- C. All patching of existing areas shall match existing materials.

## 2.10 MOTORS

- A. Motors shall be built in accordance with the latest standards of NEMA and as specified. Motors shall be tested in accordance with ASA C50 and conform thereto with respect to insulation resistance and dielectric strength.
- B. Each motor shall be provided with conduit terminal box and adequate starting and protective equipment as specified or required. The capacity shall be sufficient to operate associated driven devices under conditions of operation and load and without overload, and shall be at least the horsepower indicated or specified. Each motor type shall be for quiet operation.
- C. Motor starting equipment must be selected so that starting currents or transients do not have an adverse effect on lighting or other electrical equipment. No open transition wye-delta starting of motors shall be permitted.

## PART 3 - EXECUTION

### 3.1 GENERAL

- A. Provide information to the General Contractor for any chases or openings required under this Contract. No cutting shall be done which may affect the building structurally or architecturally without the prior approval of the Architect. Damaged construction shall be restored to its original conditions and finished to match the surrounding work. Refer to "Supplementary General Conditions" for the disposition of Cutting and Patching.
- B. Grades, elevations, and dimensions shown on the drawings are approximately correct; however, field check and otherwise verify such data at the site before proceeding with the work. Make necessary survey equipment available at all times and make use of such equipment wherever necessary to properly install equipment.
- C. The Contractor shall be entirely responsible for apparatus, equipment, and appurtenances furnished by him or his subcontractors in connection with the work and special care shall be taken to protect parts thereof in such manner as may be necessary or as may be directed. Protection shall include covers, crating, sheds or other means to prevent dirt, grit, plaster or other foreign substances from entering the working parts of machinery or equipment. Special care shall be taken to keep open ends of pipes closed while in storage and during installation. Where equipment must be stored outside the building, it shall be totally covered and secured with heavy weatherproofing tarps and kept dry at all times. Where equipment has been subjected to moisture, it shall be removed from the site and replaced with new equipment. Protect open excavating until covered over.
- D. Due to the schematic nature and small scale of the electrical drawings, it is not possible to indicate exact locations, offsets, fittings, access panels, pull boxes, and miscellaneous parts which may be required to form a complete system. The drawings are generally indicative of the work to be installed. Arrange work accordingly furnishing necessary parts and equipment as may be required to meet the various conditions and to provide a complete circuit from end use device to circuit protective device in panel.

- E. The Contractor shall include in his bid price, the cost to furnish and install the necessary amount of supply and return air ductwork, including all diffusers and return air registers, to serve the equivalent of three (3) tons of air conditioning.
- F. Within thirty (30) days after acceptance of bids, submit to the Architect for approval, a complete list of equipment and materials to be furnished under this contract, giving names and addresses of manufacturers and material they intend to furnish. This source of supply shall be listed on forms available from the Architect.

### 3.2 CLEARANCES

- A. Take caution when on routing conduit and location of equipment. In many cases, clearances in ceiling plenums is limited due to ductwork and other mechanical lines and systems and steel. The Contractor shall be responsible for routing around mechanical equipment and ducts in order that everything can remain concealed in finished areas.

### 3.3 CUTTING AND PATCHING

- A. Provide cutting and patching necessary to install the work specified herein. Patching shall match adjacent surfaces. Refer to Section 01045, Cutting and Patching, for specific direction.
- B. No structural members shall be cut without prior approval of the Architect, and such cutting shall be done in a manner directed by the Architect.
- C. Provide ceiling removal and replacement where work above ceilings is required. Replace ceiling components damaged in the process.
- D. Provide patching where electrical devices are removed from walls, ceilings or floors as required under demolition.

### 3.4 PAINTING

- A. Finished painting shall be performed by others except for standard factory finishes.
- B. Electrical motors, pump casings, and other similar items shall be provided with three coats of machinery enamel at the factory, and shall be carefully cleaned, rubbed down, and oiled after installation.

### 3.5 LOCATIONS

- A. Apply for detailed and specific information regarding the location of equipment as the final location may differ from that indicated on the drawings. Outlets, equipment or wiring improperly placed because of failure to obtain this information shall be relocated and re-installed without additional expense to the Owner. Determine the actual direction of door swings, so that local switches and other controls shall be installed at the lockside of doors, unless otherwise noted. Improperly located switches shall be relocated without additional expense to the Owner.
- B. The design shall be subject to such revisions as may be necessary to overcome building obstructions. No changes shall be made in location of outlets or equipment without written consent of the Architect and Owner.
- C. Unless otherwise mentioned or indicated, mounting heights of outlets are shown on the drawings or in the specification. Dimensions given shall be considered to be from center of outlet to finished floor.

- D. Properly rough for the electrical conduit and equipment under this contract and modify as required for coordination during the construction period.

### 3.6 DUST, DIRT AND NOISE

- A. Carry out new work and make changes, relocations, and installations with a minimum of noise. Site areas and new equipment, floors and walls, shall be adequately protected from dust and dirt caused by the work. Protection shall include suitable temporary barriers or coverings. The exterior and interior premises of each building shall be kept clean as possible during construction. Damages to surfaces or equipment as a result of negligence shall be replaced or corrected as required.

### 3.7 RECORD DRAWINGS

- A. During the construction period, maintain in good order a complete set of blue line electrical contract drawings. Record the actual electrical installation as the work progresses. Include changes to the contract and to equipment sizes and types. Keep these drawings available at the site at all times for inspection.
- B. Take proper caution against the use of superseded drawings. Check such copies and mark "void." Where drawings have been corrected by memorandum, assume the responsibility for marking all drawings so affected with the changes; such marked drawings shall remain in use until revised drawings are issued.
- C. At the conclusion of the work, obtain a set of sepias from the Architect. Incorporate "as built" data in a clearly legible manner. Return such marked prints or sepias within 30 days to the Architect.
- D. At the conclusion of the work, provide to the Architect a complete set of drawings which indicate precisely how the electrical single line and riser diagram equipment has been installed. Return such reproducible drawings within 30 days to the Architect.

### 3.8 EQUIPMENT, FOUNDATIONS, SUPPORTS, PIERS AND ATTACHMENTS

- A. Provide necessary foundations, supports, pads, bases and piers required for equipment specified in this division; submit drawings in accordance with Shop Drawing Submittal requirements prior to the purchase, fabrication or construction of same.
- B. Provide concrete pads for base-mounted transformers and rotating equipment, and for floor-mounted equipment located in equipment rooms and as indicated on the drawings. Pads shall be extended 6 inches beyond matching base in all directions with top edge chamfered. Inset 6 inch steel dowel rods into floors to anchor pads.
- C. Construction of foundations, supports, pads, bases and piers, where mounted on the floor, shall be of the same materials and same quality of finish as the adjacent and surrounding floor material.
- D. Equipment shall be securely attached to the building structure in an approved manner. Attachments shall be of a strong and durable nature and any attachments that are, in the opinion of the Architect, not strong and durable shall be replaced as directed.

### 3.9 SCAFFOLDING

- A. Furnish and erect scaffolding and ladders required in the installation of wiring, equipment and fixtures.

END OF SECTION

## SECTION 230517

### HVAC PIPING SLEEVES, SEALS, AND ESCUTCHEONS

#### PART 1 - GENERAL

##### 1.1 PIPING SYSTEM STANDARDS OF MATERIALS

- A. Piping and fitting materials shall conform to the specification standards of the recognized authorities listed below. References shall be to the latest edition in force at the time of bidding.
- B. Materials listed below shall be subject to approval of local governing authorities.

#### PART 2 - PRODUCTS

##### 2.1 PIPE SLEEVES AND ESCUTCHEON PLATES

- A. Provide sleeves for piping passing through roofs, floors, ceilings, walls, partitions, air handling equipment, structural members, and other building parts.
- B. Sealant shall be equivalent to Dow Corning 795 Silicone Sealant for general purpose use and Dow Corning 786 Mildew Resistant Silicone Sealant for Kitchen, Food Preparation, Dining areas, and wet areas. Prime sleeves in accordance with manufacturer's recommendations.
- C. Sealant in one-hour and two-hour walls and one-hour and two-hour floors shall be equivalent to Dow Corning Fire Stop System Sealants and Foams. Sealants and foams shall be UL listed and installed in accordance with manufacturer's recommendations.
- D. Schedule of Sleeve Materials

Sleeve Type	Sleeve Material
-------------	-----------------

1	18 gauge galvanized steel
2	Std. weight galvanized steel pipe
3	Std. weight galvanized steel pipe with a continuously welded water stop of 1/4 inch steel plate extending a minimum of 2 inches from the outside of the sleeve. (F&S Mfg. Co. Figure 204 or approved equal.)
4	Cast iron pipe sleeve with center flange. (James B. Clow & Sons No. F-1430 & F-1435, or approved equal.)
5	Std. weight galvanized steel pipe with flashing clamp device welded to pipe sleeve or watertight sleeves. (Josam 1870-A2 with oakum and lead caulking as required, or approved equal.)
6	Metal deck and wall sleeves.

##### E. Escutcheon Plates

1. Schedule of Escutcheon Plate Materials

Location	Escutcheon Plate Material
Finished spaces	Anodized aluminum or chrome-plated brass
Unfinished spaces	Plain brass, cast iron or aluminum

2.2 PIPE FLASHING FITTINGS

- A. Pipes passing through roof construction shall be provided with roof curb and piping portal as specified in Section 15058.

PART 3 - EXECUTION

3.1 PIPE SLEEVES

- A. Install sleeves in time to permit construction progress as scheduled.
- B. Grout sleeves to building structure for watertight fit.
- C. Schedule of Sleeve Lengths

Location	Sleeve Length
Floors	Equal to depth of floor construction and at least 1 inch above finished floor construction. In waterproof floor construction, sleeves shall extend a minimum of 2 inches above finished floor construction
Roofs	Equal to depth of roof construction including insulation
Walls and Partitions	Equal to depth of construction and terminated flush with finished surfaces

- D. Schedule of Sleeve Caulking and Packing

Caulking/ Packing Type	Caulking/Packing Requirements
A	Space between pipe and sleeve shall be packed with oakum and caulked watertight with lead.
B	Space between pipe or pipe covering and sleeve shall be caulked with an incombustible permanently plastic waterproof, non-staining compound leaving a smooth, finished appearance.
C	Verminproofing - space between pipe and sleeve shall be packed with industrial felt or fiberglass caulked at both ends with sealant according to manufacturer's recommendations. Verminproof insulation shall be minimum 1 inch thickness and shall be sections of foam glass as long as sleeves.



E. Schedule of Sleeve Applications

Location	Sleeve Type Thru Fire Rated Construction	Sleeve Type Thru Non-Fire Rated Construction	Sleeve Caulking and Packing Type
Membrane water-proof floor, roof and wall construction	5	5	C
Non-membrane waterproof floor, roof and wall construction where flashing is required	5	5	C
Interior walls, partitions, and floors	2	1 or 2	C
Exterior walls	---	3 or 4	C
Cellular metal deck floors	2	6	B
Precast concrete floor with poured concrete topping (NOTE: sleeves with flat flanges or guides which rest on top of precast slab required)	--	1	B

3.2 PIPE FLASHING FITTINGS

- A. Any pipe passing through roof construction shall be arranged to provide a minimum of 12 inches clearance from walls or other obstructions so as to permit proper flashing.

END OF SECTION

## SECTION 230529

### HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT

#### PART 1 - GENERAL

##### 1.1 PIPING SYSTEM STANDARDS OF MATERIALS

- A. Piping and fitting materials shall conform to the specification standards of the recognized authorities listed below. References shall be to the latest edition in force at the time of bidding.
- B. Materials listed below shall be subject to approval of local governing authorities.
- C. Each pipe length shall have the manufacturer's name cast, stamped, or rolled on.
- D. Each fitting shall have the manufacturer's symbol and pressure rating cast, stamped, or rolled on.

##### 1.2 APPLICABLE PUBLICATIONS

- A. The publications listed below form a part of this specification.
- B. Federal Specifications (Fed. Spec.):
  - L-C-530C ..... Coating, Pipe, Thermoplastic Resin
  - L-T-1512A ..... Tape, Pressure Sensitive Adhesive, Pipe Wrapping
  - 0-C-114B(2) ..... Calcium Hypochlorite, Technical
  - 0-S-602E ..... Sodium Hypochlorite Solution
  - BB-C-120C ..... Chlorine, Technical, Liquid
  - WW-V-35C ..... Valve Ball Brass or Bronze
  - WW-V-1967 ..... Valve, Butterfly (Threaded Ends And Solder Ends)
- C. American National Standards Institute (ANSI):
  - American Society of Mechanical Engineers (ASME): (Copyrighted Society)
  - A11.21.1M-80 ..... Floor Drains ANSI/ASME
  - B16.3-85 ..... Malleable Iron Threaded Fittings ANSI/ASME
  - B16.4-85 ..... Cast Iron Threaded Fittings Classes 125 and 250 ANSI/ASME
  - B16.9-86 ..... Factory-Made Wrought Steel Buttwelding Fittings ANSI/ASME
  - B16.11-80 ..... Forged Steel Fittings, Socket-Welding and Threaded ANSI/ASME
  - B16.12-83 ..... Cast Iron Threaded Drainage Fittings ANSI/ASME
  - B16.15-85 ..... Cast Bronze Threaded Fittings ANSI/ASME
  - B16.18-84 ..... Cast Copper Alloy Solder-Joint Pressure Fittings ANSI/ASME
  - B16.22-89 ..... Wrought Copper and Copper Alloy Solder Joint Pressure Fittings ANSI/ASME
  - B31.1 ..... Pipe Welding
  - B31.8-86 ..... Gas Transmission and Distribution Piping Systems ANSI/ASME
  - B40.1-85 ..... Gauges-Pressure Indicating Dial Type-Elastic Element ANSI/ASME
- D. American Society for Testing and Materials (ASTM):
  - A47-84 ..... Ferritic Malleable Iron Castings Revision 1989
  - A53-89 ..... Pipe, Steel, Black And Hot-Dipped, Zinc-coated Revision A Welded and Seamless
  - A74-87 ..... Cast Iron Soil Pipe and Fittings

- A183-83..... Carbon Steel Track Bolts and Nuts
- A312-89..... Seamless and Welded Austenitic Stainless Steel Pipe
- A536-84..... Ductile Iron Castings
- A733-89..... Welded and Seamless Carbon Steel and Austenitic Stainless Steel Pipe Nipples
- B32-89..... Solder Metal
- B61-86..... Steam or Bronze Castings
- B62-86..... Composition Bronze or Ounce Metal Castings
- B75-86..... Seamless Copper Tube
- B88-89..... Seamless Copper Water Tube
- B152..... Copper Sheet
- B-819..... Medical Gas Seamless Copper Tube
- B306-88..... Copper Drainage Tube (DWV)
- B584-89..... Copper Alloy Sand Castings for General Applications Revision A
- B687-88..... Brass, Copper, and Chromium-Plated Pipe Nipples
- C564-88 ..... Rubber Gaskets for Cast Iron Soil Pipe and Fittings
- D2000-86 ..... Rubber Products in Automotive Applications
- D2146-82 ..... Propylene Plastic Molding and Extrusion Materials
- D2447-89 ..... Polyethylene (PE) Plastic Pipe, Schedule 40 and 80, Based on Outside Diameter
- D2564-89 ..... Solvent Cements for Poly (Vinyl Chloride) (PVC) Pipe Plastic Pipe and Fittings
- D2665-89 ..... Poly (Vinyl Chloride) (PVC) Plastic Drain, Waste, and Revision A Vent Pipe and Fittings
- D4101-82 ..... Propylene Plastic Injection and Extrusion Materials
- E. American Water Works Association (AWWA):
  - C151-86 ..... Ductile-Iron Pipe, Centrifugally Cast in Metal Molds or Sand-Lined Molds, for Water or Other Liquids
  - C203-86 ..... Coal-Tar Protective Coatings and Linings for Steel Water Pipelines - Enamel and Tape - Hot Applied
  - C651-86 ..... Disinfecting Water Mains
  - C701-88 ..... Cold Water Meters-Turbine Type, for Customer Service
- F. National Fire Protection Association (NFPA):
  - 54-88 ..... National Fuel Gas Code
- G. American Welding Society (AWS):
  - A5.8-89..... Filler Metals for Brazing
- H. National Association of Plumbing - Heating - Cooling Contractors (PHCC):
  - National Standard Plumbing Code - 2009
- I. Cast Iron Soil Pipe Institute (CISPI):
  - 301-85 ..... Hubless Cast Iron Soil and Fittings
- J. International Association of Plumbing and Mechanical Officials (IAPMO):
  - Uniform Plumbing Code - 1988
  - IS6-82..... Installation Standard

- K. Manufacturers Standardization Society of the Valve and Fittings Industry, Inc. (MSS):  
 SP-70-84 ..... Cast Iron Gate Valves, Flanged and Threaded Ends.
- L. American Society of Sanitary Engineers (ASSE):  
 1003 ..... Water Pressure Reducing Valves  
 1010 ..... Water Hammer Arresters  
 1001-70 ..... Pipe Applied Atmospheric Type Vacuum Breakers  
 1013-88 ..... Reduced Pressure Principle Backflow Preventers  
 1015-88 ..... Double Check Backflow Prevention Assembly  
 1020-81 ..... Vacuum Breakers, Anti-Siphon, Pressure Type
- M. Factory Mutual (FM):  
 1680-89 ..... Coupling Used in Hubless Cast Iron Systems for Drains, Waste  
 and Vent Systems.

## PART 2 - PRODUCTS

### 2.1 PIPE HANGERS AND SUPPORTS

- A. General
  - 1. Hanger design shall conform to ANSI Code B 31.1.0 for Pressure Piping and the Manufacturers' Standardization Society of the Valve and Fitting Industry, (MSS) SP-58 and SP-69, unless supplemented or modified herein.
  - 2. Specified bracket clamp and rod sizes are minimum sizes. Support and hanger design shall include a safety factor of 5.
  - 3. Approved type trapeze hangers may be used instead of separate clevis hangers, with suspension rods having double nuts and securely attached to the construction in an approved manner.
  - 4. Plastic-coated hangers and clamps shall be provided for uninsulated brass or copper pipe, unless shields are provided between hangers or clamps and uninsulated brass or copper pipe.
  - 5. Provide steel required for support of pipes other than steel shown on structural drawings.
  - 6. Chain straps, perforated bars, wire hangers or expansion shields are not permitted.
  - 7. Inserts for piping shall be of a type which shall not interfere with structural reinforcing and which shall not displace excessive amounts of concrete.
  - 8. Piping located near floors that can be supported from floor or walls shall be provided with approved floor stands, wall brackets, roller supports, masonry piers or similar items.
  - 9. Resilient hangers and isolation devices shall be provided on piping connected to rotating equipment, including pumps, air handling units, and on other piping which may vibrate and create audible noise.
  - 10. Rigid hangers for horizontal piping shall provide a means of vertical adjustment after erection.

11. Hangers or supports shall be provided for existing piping that is to remain in areas affected by demolition.
12. Vertical piping shall utilize riser clamp specifically designed for piping.

B. Pipe Hanger Schedule

1. Manufacturers' Model Numbers

Hanger Type	F&S	F&M	Grinnell	Central Iron
360 shield, split	981	---	---	548
Beam Clamp	55	282	218	39
Multi-J hook blade	120	---	---	208
Clevis hangar	86	239	260	10
180 degree shield	980	80	167	550
Rigid trapeze	710	---	Std. 46	551
U-bolt	37	176	137, 137C	98H
Adj. steel pipe stanchion	421	291	259	71
Welded steel bracket	800, 801	151, 155	195, 199	195, 199
Riser clamp	91, 93, 94	241	261, 261C	37, 261
Pipe rest	92, 925	---	---	552
Base elbow support	720, 721	---	---	67, 68
Dbl. bolt pipe clamp	89	261	295	295
Welded beam attach.	966	---	66	66
Insert	180A, 180B	178	280 Series	100, 101
Cont. slotted insert	150A, 150B	190	---	50
Underground pipe hanger	275	---	---	600A

C. Hanger Rod Schedules

Pipe Size	Minimum Rod Size
Up to 2 inches	3/8 inch diameter
2-1/2 inches to 4 inches	1/2 inch diameter
4 inches to 5 inches	5/8 inch diameter
Above 5 inches	Special design

PART 3 - EXECUTION

3.1 GENERAL

- A. Provide adequate provision for expansion and contraction in portions of the piping systems, to prevent undue strains on piping, building anchor points, and connected equipment.

- B. Piping connections to plumbing fixtures and equipment shall be provided with offsets and shutoff valves arranged such that equipment can be serviced or removed without dismantling the pipe.
- C. Pitch water piping up in direction of flow to ensure adequate flow without air binding and to prevent noise and water hammer. Branch connections to mains shall be made in such a manner as to prevent air trapping and prevent free passage of air. Mains shall be laid out to meet field conditions, maintain adequate headroom and clear work.
- D. Any piping passing through roof construction shall be arranged to provide a minimum of 12 inch clearance from walls or other obstructions so as to permit proper flashing. Set pipe flashing fittings at a suitable level above the roof to permit proper termination of flashing.
- E. Converging or diverging Bullheaded Tee's are not permitted.
- F. Provide hose drain connections on water systems downstream of floor main shut-off valves.

### 3.2 PIPE HANGERS AND SUPPORTS

#### A. Pipe Hanger Support Schedule

Building Construction	Pipe Support Method
Poured concrete floor slabs	Galvanized steel inserts, and/or fish plates of sufficient area to support twice the calculated dead load
Building structural steel	Beam attachments and similar devices
Precast concrete floor slabs	Fish plates of sufficient area to support twice the calculated dead load and approve type specialty hanger accessories manufactured for the specific purpose of attaching to precast floors
Metal deck floor slabs with concrete fill	Galvanized steel inserts and/or fish plates of sufficient area to support twice the calculated dead load, and approved type specialty hanger accessories manufactured for the specific purpose of attaching to metal deck floors
Concrete slabs where piping revisions are required and approved after slabs are poured or existing slabs	"Phillips" or "Hilti" expansion bolts and shields for piping 4 inches and smaller, with main supports welded to structural steel at maximum 20 feet on center 4 inch x 4 inch x 3/8 inch thick clip knee angles with 3/4 inch expansion bolt in shear (horizontal) and supporting rod at 90° from anchor bolt for piping greater than 4 inches, attached to concrete beams or columns
Concrete floor slabs on grade with ground water condition	Drainage, waste and vent piping to be encased in slab construction

B. Pipe Support Spacing

1. Pipe supports shall be spaced as follows:

Less than 3/4 inch pipe	On 5 foot centers
1 inch and 1-1/4 inch pipe	On 6 foot centers
1-1/2 inch to 2-1/2 inch pipe	On 10 foot centers
3 inch and 4 inch pipe	On 12 foot centers
6 inch and larger pipe	On 15 foot centers
Cast iron soil pipe	Support at every joint

2. Provide hangers no more than 12 inches from direction changes.

END OF SECTION

## **SECTION 230553**

### **IDENTIFICATION FOR HVAC DUCT AND EQUIPMENT**

#### **PART 1 - GENERAL**

##### **1.1 DESCRIPTION**

- A. Provide identification of mechanical piping, valves, equipment, and ductwork installed.

##### **1.2 STANDARDS**

- A. ANSI/ASME A13.1: Scheme for the Identification of Piping Systems.

##### **1.3 ACCEPTABLE MANUFACTURERS**

- A. Seton, W.H. Brady, Bunting, or EMED Company. Provide specific model numbers where indicated.

##### **1.4 SHOP DRAWING REQUIREMENTS**

- A. Submittal not required.

#### **PART 2 - PRODUCTS**

##### **2.1 DUCT IDENTIFICATION**

- A. Provide color-coded ductwork labels with factory lettering indicating fan system identification, service, and direction of flow. Duct labels for indoor ductwork shall be flexible vinyl film with acrylic pressure-sensitive adhesive suitable for duct surface temperatures of -40°F to 220°F.

##### **2.2 EQUIPMENT NAMEPLATES**

- A. Heavy gauge (.025) aluminum with four mounting holes. Coloring in background, lettering, and pads in aluminum.

#### **PART 3 - EXECUTION**

##### **3.1 DUCT IDENTIFICATION**

- A. Duct locations to be marked are as follows:
  - 1. Ducts shall also have direction of flow arrows matching the legend and background colors adjacent to each marker and at branches.
  - 2. Markers shall be placed on ductwork at 20 foot maximum intervals on bottom and most visibly accessible side. In addition, wherever a duct passes through a wall, floor, or ceiling, it should be marked on each side of the wall, floor, or ceiling. Where duct insulation or duct is to be painted, it should be painted to match the background color of its contents (as indicated below).



B. Colors for duct marking systems shall be as follows:

<u>Duct System</u>	<u>Legend</u>	<u>Background</u>
Supply	Black	Yellow
Return	Black	Yellow
Outdoor	Black	Yellow
General Exhaust	Black	Yellow

END OF SECTION

## **SECTION 230593**

### **TESTING, ADJUSTING AND BALANCING**

#### **PART 1 - GENERAL**

##### **1.1 GENERAL**

- A. Systems shall be cleaned, pressure tests completed and approved, and in continuous operation before balancing begins. Minimum continuous operation shall be 24 hours.
- B. Final tests and adjustments necessary to demonstrate compliance with specified performance requirements for major items of equipment (such as boilers, air conditioning units and refrigeration machines) shall be directly supervised by the manufacturer's representatives.
- C. Provide complete balancing of each and every fan, trunk duct, branch duct, ducted outlet and return.
- D. Provide air system balancing and testing by an approved member of the Associated Air Balance Council (AABC) or National Environmental Balancing Bureau (NEBB). Balancing shall be in accordance with the AABC manual. The balancers must submit to the Architect a resume of experience, a sample of the forms to be used for the final report, and an inventory of the instruments to be used. Types, serial numbers and dates of last calibration of instruments used shall be listed in final balance reports.
- E. The Architect shall be notified in writing of the date and time of final balancing and testing activities. Notification must be received at least 48 hours in advance so that the Architect can be present if he so wishes.
- F. It shall be the TAB firm's responsibility to review the drawings and to notify the Engineer if additional valves and dampers are required to properly balance the various systems prior to the installation of those systems. If the TAB firm reviews the drawings and does not notify the Engineer that additional valves and dampers are required, then the TAB firm shall be responsible to provide additional valves and dampers as required to properly balance the various systems at no additional cost to the Owner.
- G. Provide test wells, openings, and dampers as required by the testing agency at no additional cost to the Owner.

##### **1.2 CERTIFIED BALANCE REPORTS**

- A. Obtain copies of the final Air Flow and Water Flow Balance and Test Reports from the balancing agencies. Submit same to the Architect in accordance with the shop drawing submittal requirements for the Architect's evaluation and approval. Final Balance and Test Reports shall be certified by a Registered Professional Engineer.

##### **1.3 AIR FLOW AND TEST PROCEDURE**

- A. The following shall be recorded for each heat pump unit, and heat recovery unit at the time of testing:
  - 1. Outdoor temperature, date, and time.
  - 2. Condition of filter (change if dirty).
  - 3. Cooling coil condition (wet/dry).

- B. The system shall be set up to provide minimum design fresh air.
  - C. The following data shall be recorded for each fan system:
    - 1. Fan and motor RPM.
    - 2. Motor current and voltage.
    - 3. Fan, coil and filter static pressures.
    - 4. Name plate data of fans and motors.
    - 5. Motor sheave, fan pulley, and belt sizes, if applicable.
  - D. Traverse the main supply, return, and exhaust ducts to determine CFM deliveries of the fan.
  - E. Check CFM at each major duct run. If fan CFMs are more than 10 percent above or 5 percent below design values, re-adjust fan speed by adjusting sheave or replacing pulleys, whichever is applicable, to obtain specified CFMs.
  - F. After it has been determined that the fans are providing design CFMs at required static pressures, balancing of the outlets may proceed. The outlets shall be balanced to within 10 percent above or 5 percent below the design values. Outlets shall be balanced at volume dampers and not at diffuser or register dampers.
  - G. If the system is equipped with an economizer free-cooling system, the balancer shall traverse the main supply ducts with the system set at 100 percent outside air. If readings indicate more than a 5 percent variation in total air supply, the fans or dampers shall be readjusted. Volume dampers shall be permanently marked at the final balance condition.
  - H. Adjust flow patterns of supply diffusers and registers to minimize drafty conditions. Install additional baffles as required.
  - I. After completion of the system air balancing and acceptance of the final report by the Architect, a final recording of the following items shall be provided and posted at the supply fan unit under cooling design conditions:
    - 1. Outside temperature, date, and time.
    - 2. Filter S.P.
    - 3. Coil S.P. and air temperature entering and leaving coils.
    - 4. Suction S.P.
    - 5. Discharge S.P. and leaving air temperature.
- 1.4 APPROVED BALANCING AGENCIES
- A. WAE Balancing, Inc. (AABC)
  - B. SSM Industries (NEBB)
  - C. Kahoe Air Balance (AABC)
  - D. PBC, Inc. (Professional Balance Co. - AABC)

## PART 2 - PRODUCTS

## 2.1 TEST HOLE CAPS

- A. Test holes shall be closed with caps suitable for duct static pressure scheduled.

## PART 3 - EXECUTION

### 3.1 GENERAL

- A. The Testing and Balancing Agency shall obtain, for their use, two (2) sets of as-built drawings from the General Contractor.
- B. Coordinate with the General Contractor to ensure proper balancing above inaccessible ceilings before the ceilings are completed.

END OF SECTION

## SECTION 230713

### DUCT INSULATION

#### PART 1 - GENERAL

##### 1.1 GENERAL

- A. Insulation shall be provided continuously through sleeves and openings.
- B. Testing of ductwork shall be complete before insulation on the exterior of the duct starts.
- C. Insulation shall stop at fire dampers and at electric duct heaters. Ends of insulation shall be sealed and lapped with vapor barrier.
- D. Duct systems shall be insulated in accordance with the schedule below.
- E. Adhesives and coatings shall be as manufactured by Insulcoustic, Benjamin Foster, or approved equivalent as follows:

		<u>Insulcoustic</u>	<u>Benjamin Foster</u>	<u>Childers</u>
1	Vapor Barrier Adhesive	225	80-07	CP-54
2	Vapor Barrier Coating	501	30-35	CP-30
3	Lagging Adhesive	102	30-36	CP-52
4	Insulation Adhesive	225	85-20	CP-54
5	Glass Cloth Adhesive	225	85-20	CP-54
6	Weatherproofing Mastic	V1-AC	GPM	CP-10/11

- F. Asbestos shall not be used in the manufacture of insulation products.

#### PART 2 - PRODUCTS

##### 2.1 TYPE I-1 INSULATION

- A. Acoustic duct lining shall consist of 1" thick glass fiber blanket of 3 pounds per cubic foot density. The airstream surface shall be protected against erosion with reinforced coating or mat-facing. Insulation edges shall be treated with a factory-applied coating to prevent surface flaring. Duct dimensions given on the drawing for lined ductwork are inside clear dimensions. Sheet metal sizes must be increased to allow for the thickness of the insulation.
- B. The liner shall meet the Life Safety Standards as established by NFPA 90A and 90B, FHC 25/50 and Limited Combustibility. The airstream surface shall be treated with an EPA-registered, anti-microbial agent so it will not support microbial growth as tested in accordance with ASTM G21 and G22. The duct lining should be rated for air velocities up to 6000 fpm and air temperatures up to 250 deg. F.
- C. Duct lining shall have a maximum thermal conductivity (K) of 0.25 Btu-in./hr.-ft<sup>2</sup>-°F at 75°F mean temperature, a minimum insulating value of R-4.2, and an NRC not less than 0.70 as tested per ASTM C 1071 using Type "A" mounting.

- D. Acoustic duct lining shall be installed in strict accordance with SMACNA Duct Construction Standards and NAIMA Duct Liner Installation Standards. The liner shall be adhered to the sheet metal with full coverage with an approved adhesive conforming to ASTM C 916. All Cut and fitted without gaps. Duct liner shall be Additionally secured with mechanical fasteners spaced per the manufacturer's recommendations. Metal nosing shall be provided over transversely oriented liner edges facing the airstream at fan discharges, access doors, and any other exposed edge conditions.
- E. Product: Owens Corning Acoustic Duct Liner, Knauf Duct Liner EM; Manville Linacoustic RC; Certainted ToughGard R.

## 2.2 EXTENT OF INSULATION

- A. Insulate the following:
  - 1. Supply ductwork
  - 2. Return ductwork
  - 3. Outside air ductwork

## 2.3 DUCT LAGGING

- A. Duct lagging shall be limp barrier material, reinforced with a fiberglass screen, and loaded with barium sulphate.
- B. Lagging shall have acoustical rating of STC-27.
- C. Product shall be Kinetics Noise Control Model KNM-100 RB.

## PART 3 - EXECUTION

### 3.1 GENERAL

- A. Insulation shall be applied on clean, dry ductwork.
- B. Apply insulation in accordance with manufacturer's recommendations.
- C. Apply lagging in accordance with manufacturer's recommendations.

END OF SECTION

## PART 1 - GENERAL

### 1.1 GENERAL

- A. Unless specifically noted otherwise, insulation shall have composite fire and smoke hazard ratings (including insulation, jacket or facing, PVC covers, and adhesives), as tested by ASTM E84, NFPA 255 or UL 723 procedures, not exceeding a flame spread rating of 25 and smoke developed rating of 50.
- B. Piping systems shall be insulated in accordance with the schedule below, including flanges, fittings, valves, expansion joints, vents, drains and similar appurtenances. Piping subject to freezing shall be insulated with a minimum of 2 inch insulation.
- C. Piping tests shall be completed before insulation proceeds.
- D. Insulation shall be provided continuously through sleeves and openings.
- E. Adhesives and coatings shall be as manufactured by Insulcoustic, Benjamin Foster, Childers, or approved equals, as follows:

	<u>Insulcoustic</u>	<u>Benjamin-Foster</u>	<u>Childers</u>
Vapor Barrier Adhesive	225	80-07	CP-54
Vapor Barrier Coating	501	30-35	CP-30
Lagging Adhesive	102	30-36	CP-52
Insulation Adhesive	225	85-20	CP-54
Glass Cloth Adhesive	225	85-20	CP-54
Weatherproofing Mastic	VI-AC	48-00	CP-10/11

- F. Asbestos shall not be used in the manufacture of insulation products.

## PART 2 - PRODUCTS

### 2.1 PIPING SYSTEM INSULATION SCHEDULE

Piping System	Insulation Type	Minimum Insulation Thickness	Notes
Air conditioning condensate, control air piping 25 feet downstream of dryer	P-1	1/2 inch	
Refrigerant piping	P-1	1-1/2 inch for pipes 1-1/4 inches and above; 1 inch for pipes under 1-1/4 inches	
Refrigerant piping	P-2	1 inch for pipes 2 inches and above; 3/4 inch for pipes under 2 inches	

## 2.2 TYPE P-1 GLASS FIBER

- A. Insulation, including fiberglass fitting inserts, shall be glass fiber with a maximum K factor of .24 at 75°F mean temperature with factory applied all-service jacket with self-sealing lip. Exposed pipe insulation material must be the one piece type. Sectional type may be used for concealed piping.
- B. Seal butt joints with 3 inch wide butt stripe adhered neatly in place.
- C. Fittings and valves for piping shall be insulated with preformed fiberglass inserts of the same density as the pipe insulation and finished with a PVC fitting cover. Provide one fiberglass insert per fitting or valve for each 1 inch of piping insulation specified. Field cut or loose blanket insulation is not acceptable.
- D. Fittings and valves for steam piping shall be insulated with fiberglass inserts and finished with .024 inch thick aluminum fitting flange and valve covers.
- E. Exposed piping outdoors shall be finished with a factory attached all-service jacket, protected with two 1/16 inch coats of Childers CP/10 or CP/11 weather barrier coating.
- F. Exposed piping in finished spaces shall be protected with .024 inch thick stainless steel or aluminum jacketing and fitting covers.
- G. Product: Owens-Corning SSL-11, Manville Micro-Lok, Knauff ASJ-SSL, Certainteed Alley-K.

## 2.3 P-2 INSULATION (PHENOLIC)

- A. Insulation, including two-piece molded fitting covers, shall be phenolic with a maximum K factor of .13 at 75°F mean temperature with factory applied all-service jacket with self-sealing lip. Exposed pipe insulation material must be the one-piece type. Sectional type may be used for concealed piping.
- B. Insulation shall be Koolphen K by Kingspan or approved equivalent.
- C. Seal butt joints with 3 inch wide butt strip adhered neatly in place.

## PART 3 - EXECUTION

### 3.1 GENERAL

- A. Insulation shall be applied on clean, dry surfaces.
- B. Insulation shall be continuous through construction openings and sleeves.
- C. Insulation on cold surfaces where vapor barrier jackets are required shall be applied with a continuous, unbroken vapor seal. Hangers, supports, anchors and similar devices that are secured directly to cold surfaces shall be adequately insulated and vapor sealed to prevent condensation.
- D. For pipes handling fluids below 70°F, provide one of the following means of preventing contact between pipe insulation and hanger or support:
  - 1. High density rigid fiberglass insulation insert, equal in thickness to pipe insulation, with factory applied jacket and metal protection shield or saddle, between pipe and hanger or support.



- 2. Insulation protection shields or saddles of sufficient length and strength to support weight of pipe without crushing insulation and shaped to fit not less than half the pipe circumference.
- E. For pipes handling fluids 70°F and above, rest pipe directly on hanger, insulate pipe and hanger.
- F. Apply insulation in strict accordance with manufacturer's recommendations.
- G. Piping located on roof shall have 18 gauge stainless steel shield a minimum of 36 inches in length the full circumference of pipe. Locate where insulation will be stepped on due to maintenance traffic.

END OF SECTION

## SECTION 231123

### NATURAL GAS PIPING

#### PART 1 - GENERAL

##### 1.1 PIPING SYSTEM STANDARDS OF MATERIALS

- A. Piping and fitting materials shall conform to the specification standards of the recognized authorities listed below. References shall be to the latest edition in force at the time of bidding.
- B. Materials listed below shall be subject to approval of local governing authorities.
- C. Plumbing systems which connect to equipment provided or installed under the HVAC section of the drawings or specifications shall be terminated within five feet of final connection point of the equipment with a shutoff valve as specified in the plumbing valve section. Final connection is specified under the HVAC section.
- D. Each pipe length shall have the manufacturer's name cast, stamped, or rolled on.
- E. Each fitting shall have the manufacturer's symbol and pressure rating cast, stamped, or rolled on.

##### 1.2 APPLICABLE PUBLICATIONS

- A. The publications listed below form a part of this specification.
- B. Federal Specifications (Fed. Spec.):
  - L-C-530C..... Coating, Pipe, Thermoplastic Resin
  - L-T-1512A ..... Tape, Pressure Sensitive Adhesive, Pipe Wrapping
  - WW-V-35C..... Valve Ball Brass or Bronze
  - WW-V-1967..... Valve, Butterfly (Threaded Ends And Solder Ends)
- C. American National Standards Institute (ANSI):
  - American Society of Mechanical Engineers (ASME): (Copyrighted Society)
  - B16.3-85..... Malleable Iron Threaded Fittings ANSI/ASME
  - B16.4-85..... Cast Iron Threaded Fittings Classes 125 and 250 ANSI/ASME
  - B16.11-80..... Forged Steel Fittings, Socket-Welding and Threaded ANSI/ASME
  - B16.15-85..... Cast Bronze Threaded Fittings ANSI/ASME
  - B31.1 ..... Pipe Welding
  - B31.8-86..... Gas Transmission and Distribution Piping Systems ANSI/ASME
  - B40.1-85..... Gauges-Pressure Indicating Dial Type-Elastic Element  
ANSI/ASME
- D. American Society for Testing and Materials (ASTM):
  - A47-84..... Ferritic Malleable Iron Castings Revision 1989
  - A53-89..... Pipe, Steel, Black And Hot-Dipped, Zinc-coated Revision A  
Welded and Seamless
  - A183-83..... Carbon Steel Track Bolts and Nuts
  - A312-89..... Seamless and Welded Austenitic Stainless Steel Pipe
  - A536-84..... Ductile Iron Castings

- A733-89..... Welded and Seamless Carbon Steel and Austenitic Stainless Steel Pipe Nipples
- B32-89..... Solder Metal
- B62-86..... Composition Bronze or Ounce Metal Castings
- B75-86..... Seamless Copper Tube
- D2564-89 ..... Solvent Cements for Poly (Vinyl Chloride) (PVC) Pipe Plastic Pipe and Fittings
- D4101-82 ..... Propylene Plastic Injection and Extrusion Materials
- E. American Welding Society (AWS):
  - A5.8-89..... Filler Metals for Brazing
- F. National Association of Plumbing - Heating - Cooling Contractors (PHCC):
  - National Standard Plumbing Code - 1990
- G. International Association of Plumbing and Mechanical Officials (IAPMO):
  - Uniform Plumbing Code - 1988
  - IS6-82..... Installation Standard
- H. Manufacturers Standardization Society of the Valve and Fittings Industry, Inc. (MSS):
  - SP-70-84 ..... Cast Iron Gate Valves, Flanged and Threaded Ends.

## PART 2 - PRODUCTS

### 2.1 PIPING AND FITTINGS MATERIAL SCHEDULE

- A. Piping systems shall be constructed of the following materials as scheduled below, subject to approval by authorities having jurisdiction.

Systems	Pipe	Fittings	Remarks
Natural gas piping below grade	Schedule 40 black steel pipe	Welded steel fittings	1) Pipe coating and anodes in accordance with gas company requirements 2) Welding to be performed by a certified welder
Natural gas piping above ground outside building	Schedule 40 black steel pipe	Screwed malleable iron for fittings 2 inches and smaller, welded steel for fittings larger than 2 inches	1) Pipe painting and support in accordance with gas company requirements 2) Welding to be performed by a certified welder
Natural gas piping	Schedule 40 black	Screwed malleable iron	1) Pipe painting

Systems	Pipe	Fittings	Remarks
inside building	steel pipe	for fittings 2 inches and smaller, welded steel for fittings larger than 2 inches	and support in accordance with gas company requirements  2) Welding to be performed by a certified welder  3) Sleeve and vent for gas pipe in ceiling space and riser per gas company requirements

## 2.2 PLUMBING PIPING SYSTEM PRESSURE CLASSIFICATION

1. Piping, fittings, components, and equipment for natural gas systems shall have an operating pressure of 4 inches and a component rating pressure of 125 psig.

## PART 3 - EXECUTION

### 3.1 GENERAL

- A. The drawings schematically indicate the size and location of piping. Piping system layout shall be modified as required to meet field conditions and facilitate coordination. Piping shall conform to the latest ASA code for pressure piping. Unless otherwise noted, all piping, valves, and associated fittings shall be concealed behind walls, above ceilings, or below floors.
- B. Provide adequate provision for expansion and contraction in portions of the piping systems, to prevent undue strains on piping, building anchor points, and connected equipment.
- C. Piping connections to plumbing fixtures and equipment shall be provided with offsets and shutoff valves arranged such that equipment can be serviced or removed without dismantling the pipe.
- D. Any piping passing through roof construction shall be arranged to provide a minimum of 12 inch clearance from walls or other obstructions so as to permit proper flashing. Set pipe flashing fittings at a suitable level above the roof to permit proper termination of flashing.
- E. Converging or diverging Bullheaded Tee's are not permitted.
- F. Provide hose drain connections on water systems downstream of floor main shut-off valves.

### 3.2 PIPING SYSTEM PRESSURE TESTS

- A. The following procedures shall be observed for piping system pressure tests:
  1. Preliminary testing, notification of inspectors and other responsibilities as specified in Section 15010, Paragraph 1.9 - CODES, PERMITS AND INSPECTIONS shall be observed.

2. Take all due precautions to prevent damage to the building and its contents that may be incurred by such tests; repair or make good any damage caused by the tests at no additional cost to the Owner.
3. Tests shall apply full test pressure to the piping for a sufficient period of time to detect leaks and defects. Refer to individual piping testing procedures for approved testing of liquids or gases.
4. Tests shall be conducted prior to the installation of any required fitting insulation. If delicate control mechanisms, not including control valves, are installed in the piping, they shall be removed to prevent shock damage.
5. The section of piping to be tested shall be brought up to the specified test pressure. If the test pressure falls more than the specified amount during the test period, the point of leakage shall be found, repaired and the test repeated. This procedure shall be repeated until the piping system has been proved absolutely tight.
6. Leaks shall be repaired by removing the valve, fitting, joint or section that is leaking and reinstalling new materials and joints as specified. Use of mastic of "no-leak" compounds or other temporary means of repairing leaks shall not be permitted.

### 3.3 NATURAL GAS SYSTEM

#### A. Installation Procedure

1. Piping shall be installed without pockets, with drips at low points and with valves at each outlet.
2. Final connections shall be made to pieces of equipment.
3. Right and left nipples shall not be used in lieu of unions.
4. Complete gas service connections to existing gas utility mains with service extensions into buildings, piping, valves, metering and pressure regulation in accordance with utility company requirements.
5. Provide plug valves at gas piping risers and main control points.
6. Provide gas cocks at gas equipment and appliances.

#### B. Natural Gas System Inspection

1. Every third weld in the gas riser piping shall be x-ray inspected in accordance with the gas company requirements. The results of the tests shall be forward to the gas company and to the Architect.

#### C. Natural Gas System Testing

1. The entire gas piping system shall be tested in accordance with the gas company requirements. At a minimum, piping shall be tested at a pressure of 90 psig for 24 hours using a recording type pressure gauge. Test natural gas sleeves at a pressure of 90 psig for 24 hours using a recording type pressure gauge. Equipment, materials and services required shall be provided.
2. Final tests shall be conducted in the presence of and to the satisfaction of the Architect and inspectors of any and all authorities having jurisdiction, including the gas company, who shall be notified a minimum of 48 hours in advance of same. Preliminary testing shall be completed prior to such notification.

3. While subjected to the test pressure, the piping system shall be visually examined for signs of leakage or other defects. Exposed joints shall be checked by means of a soap bubble test or other foaming agent test. Any reduction to test pressure measured by the gauge during the testing period shall be deemed to indicate the presence of a leak unless such reduction can be readily attributable to some other cause.
4. Test records shall be maintained during the testing and shall confirm that piping has been pressure tested as specified above.
5. Purging of piping shall be accomplished in accordance with the provisions contained in USAS-Z-83.1.

END OF SECTION

## **SECTION 232113**

### **HVAC PIPING**

#### **PART 1 - GENERAL**

##### **1.1 PIPING SYSTEM STANDARDS OF MATERIALS**

- A. Piping and fitting materials shall conform to the specification standards of the recognized authorities listed below. References shall be to the latest edition in force at the time of bidding.
- B. Materials listed below shall be subject to approval of local governing authorities.
- C. Each pipe length shall have the manufacturer's name cast, stamped, or rolled on.
- D. Each fitting shall have the manufacturer's symbol and pressure rating cast, stamped, or rolled on.

#### **PART 2 - PRODUCTS**

##### **2.1 PIPING AND FITTINGS MATERIAL**

- A. Piping systems shall be constructed of the following materials as indicated below, subject to approval by authorities having jurisdiction.
- B. REFRIGERANT PIPING
  - 1. Type L or type K hard drawn copper tubing with brazed joints
  - 2. Fittings shall be wrought copper solder type brazed with silver alloy equivalent to Sil-Fos. Fitting pressure rating shall be per ASNI B16.22.

##### **2.2 PIPE FLASHING FITTINGS**

- A. Pipes passing through roof construction shall be provided with roof curb and piping portal.

#### **PART 3 - EXECUTION**

##### **3.1 GENERAL**

- A. The drawings schematically indicate the size and location of piping. Piping system layout shall be modified as required to meet field conditions and facilitate coordination among contractors at no additional cost. Piping shall conform to the latest ASA code for pressure piping. Unless otherwise noted, all piping and associated fittings shall be concealed behind walls, above ceilings, or below floors.
- B. Provide adequate provision for expansion and contraction in portions of the piping systems, to prevent undue strains on piping and connected equipment.
- C. Converging and diverging bullhead tee's will not be permitted in piping systems.
- D. "T" drill type fittings will not be permitted in piping systems.

##### **3.2 REFRIGERANT PIPING**

- A. Refrigerant Piping Pressure Test
  - 1. Test piping prior to installation of insulation.

2. Purge piping system with nitrogen during installation.
3. Provide nitrogen and pressurize to 125 psig on the high side and 125 psig on the low side. Leak check with bubble solution. If pressure drops or if leaks are detected, provide new piping, fittings, and connections as required. System shall be recharged and purged with nitrogen before brazing. Locate leak in a manner approved by the EPA or other governing agencies.
4. Maintain the required test pressure for a sufficient length of time to enable an inspection of all joints and connections.
5. Tests shall be performed after installation of the piping systems and prior to acceptance of same.
6. Provide appropriate vacuum pump and evacuate refrigerant piping to 500 microns. Allow system to stand under vacuum of 500 microns for four (4) hours. If the vacuum reading remains unchanged, the system is ready to receive its charge of refrigerant.
7. Charge refrigerant systems in accordance with manufacturer's recommendations.

### 3.3 DRIP PANS FOR PROTECTION OF ELECTRICAL EQUIPMENT

- A. Examine the drawings and in cooperation with the Electrical Contractor confirm the final location of electrical equipment to be installed in the vicinity of piping. Plan and arrange overhead piping no closer than 2 feet from a vertical line to electric motors and controllers, switchboards, panel boards, or similar equipment. Piping is not permitted in electric equipment rooms, transformer rooms, switchgear rooms, nor telephone gear rooms.
- B. Where the installation of piping does not comply with the requirements of foregoing paragraph, where feasible, the piping shall be relocated.
- C. Where piping cannot be relocated, furnish gutters as follows:
  1. Provide and erect a gutter of 16 ounce cold rolled copper or heavy galvanized steel, under every pipe which is within 2 feet from a vertical line to any motor, electrical controllers, switchboards, panel boards, or the like.
  2. Each gutter shall be soldered and made watertight, properly suspended and carefully pitched to a convenient point for draining. Provide a 3/4 inch drain, with valve as directed, to nearest floor drain or slop sink, as approved.
  3. In lieu of such separate gutters, a continuous protecting sheet of similar construction adequately supported and braced, properly rimmed, pitched and drained, may be provided over any such motor, and extending 2 feet in all directions beyond the motor, over which such piping has to run.

END OF SECTION



## **SECTION 233113**

### **DUCTWORK**

#### **PART 1 - GENERAL**

##### **1.1 GENERAL**

- A. References to SMACNA-HVAC shall be "SMACNA HVAC Duct Construction Standards, Metal and Flexible" latest edition unless otherwise noted. References to SMACNA-Industrial shall be "SMACNA Industrial Duct Construction Standards" latest edition unless otherwise noted.
- B. When the specifications refer to SMACNA Standards, they shall be considered as minimum standards; if local codes or requirements specified herein require more restrictive standards than described in SMACNA, the local codes and requirements specified herein shall govern.
- C. Ductwork indicated on drawings is schematic; therefore, changes in ductwork sizes and/or location shall be made when necessary to conform to space conditions. Changes shall be made at no additional cost to the Owner. The engineer shall be consulted for approval of duct size changes which cannot maintain the same equivalent free area dimensions or which require an aspect ratio greater than 4 to 1. Change in duct sizes shall be made with transitions. Transitions shall have not more than a 30° angle parallel to the airflow for a one sided transition or 15° angle for a two sided transition.
- D. Duct dimensions indicated on drawings shall be the clear inside dimensions. Provide hat section at turning vanes, dampers, etc., as indicated in SMACNA Figure 2-24.
- E. Ductwork shall be constructed true to sizes indicated and shall be airtight with a smooth appearance.
- F. Coil frames, damper frames, louver frames, etc., shall be bolted and sealed to ductwork.
- G. Provide additional bracing and reinforcing as necessary to prevent buckling and bulging of ductwork.
- H. Provide pre-fabricated panel casings for outside air intake plenums and relief air plenums as shown on drawings and as hereinafter specified.

#### **PART 2 - PRODUCTS**

##### **2.1 GENERAL**

- A. Ductwork, fittings, reinforcement, hangers, etc., shall be in accordance with SMACNA-HVAC or SMACNA-Industrial.

##### **2.2 PRESSURE CLASSIFICATION**

- A. Duct construction for the duct systems shall have a pressure rating of not less than 2 inches for supply and return air ductwork.
- B. All exhaust ductwork shall have a pressure rating of not less than -1 inch for all exhaust ductwork.
- C. Elbows shall be of radius construction with throat radius equal to or greater than the width of the duct unless otherwise indicated. Square construction with double radius

turning vanes may be used where space limitations prohibit radius construction. Radius elbows with square throats are not permitted.

- D. Size changes in ductwork should not occur at elbows.
- E. Offsets in ductwork shall be 30° unvaned radius elbows.
- F. Round elbows shall have a minimum of 5 sections.

## 2.3 GALVANIZED STEEL DUCTWORK

- 1. Galvanized construction including sheet metal hangers and miscellaneous materials.
- 2. Construction shall be in accordance with SMACNA-HVAC.
- 3. Duct sealing shall meet duct seal Class C. Metal gauge for duct sides shall be the same thickness.
- 4. Final connections from sheet metal ductwork to diffusers, registers and grilles shall be made with either insulated flexible duct, round ductwork, or rectangular ductwork. Insulated flexible duct shall be Flexmaster Type 3M or approved equivalent. Interior liner shall be trilaminated aluminum foil, fiberglass, and aluminum polyester with a helix encapsulated in the fabric. Insulation shall be 1-1/2 inch fiberglass, compressed to 1 inch thick, and exterior jacket shall be a fire retardant, reinforced aluminum vapor barrier material. Duct shall be UL listed for Class 1 air duct and shall be suitable for operation at up to 12 inches w.g. and velocities to 4,500 fpm. Flexible ducts shall be joined to rigid ducts and box inlets by metal or flexible drawband and duct mastic equivalent to "Ductmate." Flexible ductwork shall conform to SMACNA Duct Performance Standards for flexible duct. Maximum flexible duct length: 5 feet.

## 2.4 FLEXIBLE DUCTWORK

- A. Flexible ductwork shall be factory constructed with a chlorinated polyethylene (CPE) core having a vinyl coated, carbon steel wire helix. Woven fiberglass insulation impregnated with vinyl shall be applied over core with an external metallized polyester film.
- B. Ductwork shall have a minimum R-value of 4.2 and have an operating temperature range of -20°F to 250°F continuous. Ductwork shall have a positive operating pressure of 16" w.g. up to 10" ID and 10" w.g. from 12" to 16" I.D. Ductwork shall have a negative operating pressure of 2" w.g.
- C. Ductwork shall meet UL181 and NFPA 90A-90B Fire Codes.
- D. Flexible ductwork shall be Thermaflex M-KC or approved equal.

## 2.5 SLEEVES

- A. Provide sleeves for ducts passing through roofs, walls, floors and partitions.
- B. Sleeve material shall be 20 gauge galvanized steel except for fire walls and smoke barriers which shall be 16 gauge galvanized steel.
- C. Sealant shall be equivalent to Dow Corning 795 Silicone Sealant for general purpose use. Prime sleeves in accordance with manufacturer's recommendations.

- D. Sealant in one-hour and two-hour walls and one-hour and two-hour floors shall be equivalent to Dow Corning Fire Stop System Sealants and Foams. Sealants and foams shall be UL listed and installed in accordance with manufacturer's recommendations.

## PART 3 - EXECUTION

### 3.1 GENERAL

- A. Ductwork construction shall be in strict accordance with the SMACNA-HVAC Standards including ductwork gauges, bracing, reinforcement, joints, seams, hanging, and construction.
- B. The drawings schematically indicate the size and location of ductwork. Ductwork system layout shall be modified as required to meet field conditions and facilitate coordination at no additional cost. Unless otherwise noted, ductwork, dampers, and associated fittings shall be concealed behind walls or above ceilings.

### 3.2 SLEEVES

- A. Provide 1/2 inch clearance between duct or duct insulation and sleeve.
- B. Install sleeves in time to permit construction progress as scheduled.
- C. Grout sleeves to building for watertight fit.
- D. Schedule of Sleeve Lengths

Location	Sleeve Length
Floors	Equal to depth of floor construction and at least 1 inch above finished floor construction. In waterproof floor construction, sleeves shall extend a minimum of 2 inches above finished floor construction.
Roofs	Equal to depth of roof construction including insulation.
Walls and Partitions	Equal to depth of construction and terminated flush with finished surfaces.

- E. Schedule of Sleeve Caulking and Packing Type

Caulking/ Packing Type	Caulking/Packing Requirements
A	Caulking not required.
B	Space between duct or duct covering and sleeve shall be vermin proof sealant.
C	Space between duct and sleeve shall be packed with industrial felt or fiberglass caulked at both ends with sealant according to manufacturer's recommendations. Vermin proofing for ducts with insulation shall be minimum 1 inch thick sections of foam glass as long as sleeve with space between foam glass and sleeve packed

Caulking/ Packing Type	Caulking/Packing Requirements
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with industrial felt or fiberglass caulked at both ends with sealant in accordance with manufacturer's recommendations.

F. Schedule of Sleeve Applications

Location	Sleeve Caulking and Packing Type
Membrane water-proof floor, roof and wall construction	C
Non-membrane waterproof floor, roof and wall construction where flashing is required	C
Interior walls, partitions, and floors	C
Exterior walls	C

### 3.3 DUCT HANGERS AND SUPPORTS

A. Duct Hanger Support Schedule

Building Construction	Duct Support Method
Poured concrete floor slabs	Galvanized steel inserts, and/or fishplates of sufficient area to support twice the calculated dead load
Building structural steel	Beam attachments and similar devices
Precast concrete floor slabs	Fishplates of sufficient area to support twice the calculated dead load and approve type specialty hanger accessories manufactured for the specific purpose of attaching to precast floors
Metal deck floor slabs with concrete fill	Galvanized steel inserts and/or fishplates of sufficient area to support twice the calculated dead load, and approved type specialty hanger accessories manufactured for the specific purpose of attaching to metal deck floors
Concrete slabs where piping revisions are required and approved after slabs are poured, or existing concrete slabs	"Phillips" or "Hilti" expansion bolts and shields for piping 4 inches and smaller, with main supports welded to structural steel at maximum 20 feet on center 4 inch x 4 inch x 3/8 inch thick clip knee angles with 3/4 inch expansion bolt in shear (horizontal) and supporting rod at 90° from anchor bolt for piping greater than 4 inches, attached to concrete beams or

Building Construction	Duct Support Method
	columns
Concrete floor slabs on grade with ground water condition	Drainage, waste and vent piping to be encased in slab construction

B. Duct Support Spacing

1. Duct supports shall be spaced as per SMACNA. Provide shop drawings of support type and spacing.

END OF SECTION

## **SECTION 233300**

### **AIR DUCT ACCESSORIES**

#### **PART 1 - GENERAL**

##### **1.1 BALANCING DAMPERS**

- A. Provide manual balancing dampers at each diffuser or register and as shown on the drawings. Dampers at diffusers and registers shall be placed as far as practical from the outlet. Construction of dampers shall conform to SMACNA Standards for the intended operating pressure range.

##### **1.2 FIRE DAMPERS**

- A. Provide fusible link fire dampers as indicated on the drawings and specified herein.

##### **1.3 DUCT ACCESS DOORS**

- A. Provide suitable access doors and frames as required to permit inspections, operation and maintenance of fire dampers which are concealed by sheet metal work, access to kitchen hood exhaust ducts, where indicated on the drawings, and where specified.

##### **1.4 FLEXIBLE CONNECTIONS**

- A. Fan and air supply units, both at inlet and discharge, shall be made with flexible material so as to prohibit the transfer of vibration from fans to connecting ductwork, without air leakage. The flexible material shall have sufficient slack so as to prevent tearing due to fan movement.

#### **PART 2 - PRODUCTS**

##### **2.1 BALANCING DAMPERS**

- A. Balancing dampers for rectangular ductwork shall be opposed blade type, and shall be Ruskin Model MD35 Manual Balancing Damper with Locking Quadrant or equivalent for duct pressure ratings 2 inches w.g. or less, and Ruskin Model CD30AF1 with Locking Quadrant or equivalent for duct pressure ratings greater than 2 inches w.g..
- B. Balancing dampers for round ductwork shall be Ruskin Model MDRS25 Round Manual Balancing Damper with Locking Quadrant, or equivalent.

##### **2.2 FIRE DAMPERS**

- A. Fusible link dampers shall be of the folding blade type, shall meet the requirements of NFPA Bulletin 90A, and shall be UL listed and tested in accordance with UL 555 test criteria. Provide fire dampers UL listed for installation in 1-1/2 hour or 2-hour fire separations or divisions.
- B. Fire dampers for vertical installation shall be gravity operated. Fire dampers for horizontal installation shall have closure springs and latches.
- C. Fire dampers shall have resettable reusable fire link rated at 165°F.
- D. Fire dampers installed in ductwork shall be Ruskin Model IBD2, Style C, CR, or CO to match duct shape, or equivalent. Maximum pressure drop: 0.05 inches w.g. at 1500 fpm face velocity. Alternate styles may be submitted if performance characteristics are met.

- E. Equivalent manufacturers: Ruskin, Prefco, National Control Air, Safe-Air, Greenheck, Pottorff.

## 2.3 DUCT ACCESS DOORS

- A. In general, access doors shall be at least 18 inches x 18 inches where physically possible; access doors for fire dampers shall be sized in accordance with the fire damper size.
- B. Access doors shall be of double construction and shall be gasketed around the entire perimeter to minimize air leakage between door and frame. Access doors in insulated ducts or casings, and fire damper access doors, shall be fully insulated with rigid fiberglass insulation between the metal panels.
- C. In no case shall access to any items of equipment require the removal of nuts, bolts, screws, wedges or any other loose devices.
- D. Access doors installed in ductwork 2 inches w.g. class and below shall be Ruskin Model ADH22, or equivalent.
- E. Access doors installed in ductwork above 2 inches w.g. class shall be Ruskin Model ADHP-3 High Pressure Access Doors, or equivalent.

## 2.4 FLEXIBLE CONNECTIONS

- A. Flexible connections shall be a minimum of 8 inches long.
- B. Flexible connection shall be fabricated from approved flameproofed fabric in accordance with the applicable sections of the NFPA overall fire codes. Asbestos cloth is not permitted.

## PART 3 - EXECUTION

### 3.1 BALANCING DAMPERS

- A. Provide balancing dampers where shown on drawings and provide one volume damper at every diffuser. Volume damper shall be placed as far away from outlet as possible.
- B. When installing dampers in ducts to be insulated, provide raised bracket for damper quadrant with height equal to the insulation thickness.
- C. Locate dampers as far as possible from air outlet to minimize noise generation and transmission.
- D. Coordinate access to each damper and provide remote damper actuator if required to facilitate access.

### 3.2 FIRE DAMPERS

- A. Comply with applicable UL recommendations, including those for breakaway connections at maximum distance of 6 inches from wall, and the requirements of local authorities having jurisdiction.
- B. Install fire dampers in strict accordance with the SMACNA Fire Damper and Heat Stop Guide for Air Handling Systems, and applicable NFPA standards and local authorities having jurisdiction.

### 3.3 FLEXIBLE CONNECTIONS

- A. Flexible connections shall be held in place with heavy metal bands securely attached to prevent air leakage at the connection points.
- B. Seal insulation at both ends to maintain insulation and vapor barrier continuity.
- C. Do not kink flexible ducts. Supports ducts with galvanized hangers to avoid sagging.

END OF SECTION



## SECTION 233423

### EXHAUST FANS

#### PART 1 - GENERAL

##### 1.1 GENERAL

- A. Provide fans as shown on the drawings and specified herein.
- B. Fan performance data shall be AMCA certified for sound and air performance.
- C. Fans shall be provided complete with motors and drives. Belt drive fans shall be provided with belt guards meeting OSHA requirements. Belt guards shall allow speed measurement at both fan and motor without removing guard. Each fan shall include an allowance for one pulley and belt change during balancing procedures.
- D. Provide appropriate weather covers for motors and belts where fans are exposed to weather.
- E. Fans shall be balanced statically and dynamically for maximum rated speed.
- F. Submit fan volume-pressure-horsepower curves for approval as indicated under shop drawings.
- G. Bearings shall be ball or roller anti-friction type with minimum L<sub>10</sub> life of 160,000 hours.
- H. Fans shall be:
  - 1. Catalog rated for 15 percent greater static pressure than specified at air volume,
  - 2. Selected so that the specified air volume is greater than that at the apex of the fan pressure volume curve, and
  - 3. Selected to provide stable operation down to 85 percent of design volume operating at the required speed for the specified conditions.
- I. Brake horsepower for backward inclined bladed centrifugal fans shall not exceed 78 percent of motor nameplate horsepower times the NEMA service factor, and for forward curved bladed centrifugal fans shall not exceed 70 percent at specified duty.
- J. Where internal coating is indicated, factory apply Glidden SP24-CE double built epoxy 10 Mil to all metal surfaces including dampers, screens, curbs, in contact with air stream. Prepare steel surfaces by sandblasting per Steel Structure Painting Council Std. SP10-63 (near white). Use Type 316 stainless steel in lieu of coating at supplier's option or where required for component operation.
- K. Lubricate bearings for extended shutdown or storage and rotate shafts every four weeks until fans are put into permanent operation.

#### PART 2 - PRODUCTS

##### 2.1 GENERAL

- A. Refer to Section 233113 for component and equipment ratings. All components, equipment, and specialties, etc., shall meet the component pressure rating listed.

## 2.2 IN-LINE CABINET FANS

- A. Fans shall be duct-mounted and shall be of the centrifugal direct drive type with insulated galvanized steel housing. Fans shall be AMCA and UL rated. Duct collars with flexible connectors shall be provided on inlet and outlet of fans. The outlet duct shall include an aluminum backdraft damper and shall be adaptable for horizontal or vertical discharge.
- B. Fan shall have a cord, plug, and receptacle inside the housing. The fan motor and wheel assembly shall be removable. Fan shall be isolated.

Manufacturers: Greenheck, Loren Cook, Ilg

## 2.3 CEILING CABINET FANS

- A. Fans shall have insulated galvanized steel housing. Fan shall be AMCA and UL rated. Fan shall have centrifugal wheel or wheels. Face grille shall be provided on ceiling fans. Duct collar with flexible connector shall be provided on in-line fans.
- B. Fan shall have a cord, plug, and receptacle inside the housing. The fan motor and wheel assembly shall be removable. Fan shall be isolated.
- C. Manufacturers: Greenheck, Loren Cook, Ilg

## PART 3 - EXECUTION

### 3.1 GENERAL

- A. Bolt motors securely to bases or supports.
- B. Verify proper rotation of fan.
- C. Adjust fan speed to handle the air quantity and pressure listed on the drawings.
- D. Measure the fan motor current draw and verify that the fan motor is not overloaded.

END OF SECTION

## **SECTION 233713**

### **DIFFUSERS, REGISTERS AND GRILLES**

#### **PART 1 - GENERAL**

##### **1.1 GENERAL**

- A. Provide diffusers, registers and grilles as scheduled on the drawings and specified herein. Refer to architectural reflected ceiling plans for exact locations of diffusers, registers and grilles. Make minor modifications to ductwork as required.
- B. Diffusers, registers and grilles shall be tested and rated in an ADC Certified Laboratory in accordance with ADC requirements.

#### **PART 2 - PRODUCTS**

##### **2.1 CEILING DIFFUSERS**

- A. Ceiling Diffusers shall be equivalent to Price Series SMD, constructed of steel and having fixed one-, two-, three- or 4-way air discharge pattern as indicated on the drawings for supply. Diffuser shall have a removable core and louver blades.
- B. Unit shall be complete with opposed blade damper and enamel finish with color selected by the Architect. Frame shall be suitable for tee-bar lay-in with 24 x 24 module size for use in 24 x 24 or 24 x 48 ceiling grid system. Where used in a non-modular ceiling, an integral one inch surface mounting flange shall be provided.
- C. Ceiling diffusers shall be furnished in a baked enamel finish as selected by the Architect.

##### **2.2 SUPPLY AIR REGISTERS**

- A. Supply Air Registers shall be equivalent to Price Series 520, constructed of steel, double deflection type and provided with opposed blade damper.
- B. Registers shall have adjustable horizontal face blades with  $\frac{3}{4}$ " spacing of both front and rear blades. A perimeter mounting flange of  $\frac{7}{8}$ " shall be provided.
- C. Registers shall be furnished in a baked enamel finish as selected by the Architect.

##### **2.3 RETURN AIR REGISTERS**

- A. Return Air Registers shall be equivalent to Price Series 535D, constructed of steel, having fixed louvers at 45° deflection,  $\frac{1}{2}$ " blade spacing, and provided with opposed blade damper.
- B. Registers shall have a perimeter mounting flange of  $\frac{7}{8}$ ".
- C. Registers shall be furnished in a baked enamel finish as selected by the Architect.

## 2.4 RETURN AND TRANSFER AIR GRILLES

- A. Return and Transfer Air Grilles shall be equivalent to Price Series 535, constructed of steel, having fixed louvers at 45° deflection with ½" blade spacing.
- B. Grilles shall have a perimeter mounting flange of 7/8".
- C. Grilles shall be furnished in a baked enamel finish as selected by the Architect.

## 2.5 PRODUCTS

- A. Use products from one of the following manufacturers: Price, Titus, Tuttle & Bailey, Krueger.

## PART 3 - EXECUTION\_ (Not Used)

END OF SECTION

## **SECTION 233725**

### **LOUVERS**

#### **PART 1 - GENERAL**

##### **1.1 RELATED DOCUMENTS**

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

##### **1.2 PERFORMANCE REQUIREMENTS**

- A. Structural Requirements: Design louvers to safely withstand dead load and live loads prescribed by governing building code.
- B. Thermal Movement: Design to accommodate expansion and contraction resulting from normal air temperature range of minus 20 to plus 110 degrees F, solar heat gain, and nighttime re-radiation without buckling, undue stress on structural elements, reduction of performance, or detrimental effects.

##### **1.3 SUBMITTALS**

- A. Product Data.
- B. Wall Louvers: Louver size, louver type, and material.
- C. Shop Drawings: Show elevations, field measurements (if applicable), reinforcement, anchorages, and expansion provisions.
  - 1. Include air supply and pressure drop information.

##### **1.4 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: A company designing, manufacturing, and installing projects of this section which have performed in a satisfactory manner under comparable conditions for a period of 5 years.

##### **1.5 PROJECT CONDITIONS**

- A. Field Measurements: Where conditions permit, take field measurements and determine actual installed positions of louvers before beginning louver fabrication.

#### **PART 2 - PRODUCTS**

##### **2.1 MANUFACTURERS**

- A. Wall Louver Manufacturers:
  - 1. Greenheck
  - 2. Pottorff
  - 3. Ruskin Manufacturing
  - 4. Airolite Company

## 2.2 MATERIALS

- A. Aluminum Extrusions: ASTM B221, manufacturer's standard alloy and temper for application finish required.
- B. Fasteners:
  - 1. For aluminum members: Aluminum, stainless steel, or galvanized steel.
  - 2. For steel or galvanized steel members: Stainless steel or galvanized steel.
  - 3. For stainless steel members: Stainless steel.
  - 4. Finish exposed-to-view fasteners heads to match adjacent surface.
- C. Anchors and Inserts: Hot-dip galvanized steel or nonferrous mastic.
- D. Bituminous Paint: SSPC-Paint 12; cold-applied asphalt mastic

## 2.3 FIXED WALL LOUVERS

- A. Louver: Drainable blade, standard mullions type.
  - 1. Depth: 4 inches.
  - 2. Fabricate blades and frame from extruded aluminum; minimum thickness: 0.018 inch.
  - 3. Basis of design: Greenheck Model "ESD-403"
  - 4. Finish: Clear anodized.
  - 5. Accessories:
    - a. Bird screens
    - b. Subsill flashing
- B. Performance Requirements
  - 1. Test data for a 4 foot by 4 foot unit. Data given will be considered minimum requirements.
  - 2. Percent free area: 50.0 percent.
  - 3. Air pressure drop: 0.14 inches w.g. at 1,000 fpm through free area.
  - 4. Water penetration: 0.01 oz./sq.ft. at 1007 fpm

## 2.4 FABRICATION

- A. Provide complete. Shop-fabricated units, unless unit size dictates shipment in pieces; mark each component as required for proper field assembly.
- B. Minimize the necessity for field assembly and field modifications. Coordinate shop drawings. Field measurements, and shop fabrication.
- C. Fabricate frames to indicated profiles with features and clearances to suit installation conditions.
  - 1. Include integral sills of finish and construction to match louver.
    - a. At locations indicated or where required to prevent drainage infiltration, provide sill extensions or subsill flashings of same finish and material as louver.

- 2. Provide clearance or recesses as required to accommodate sealant between louver and adjacent construction.
  - D. Provide shop-welded joints between framing components, and between framing components and fixed louver blades, unless otherwise indicated or where field assembly is unavoidable
  - E. Provide uniform spacing between blades, including gap between blades and exposed face of head and sill members.
  - F. Provide vertical mullions of type indicated.
- 2.5 FINISHES
- A. Mill Finish: As fabricated, welds cleaned and dressed, exposed welds ground smooth. Remove oil, grease, dirt, and weld spatter from finished units.

### PART 3 – EXECUTION

#### 3.1 EXAMINATION

- A. Verify that substrates and opening to receive louvers are rigidly set, at proper lines and elevation. Properly sized, and ready to receive louvers.
- B. Do not proceed with installation until conditions detrimental to proper installation have been corrected.

#### 3.2 PREPARATION

- A. Coat contact surfaces of dissimilar metals with one or more coats of bituminous paint.
  - 1. The following metals are not considered dissimilar: Aluminum, stainless steel, and zinc.
- B. Apply one 15-mil dry film thickness coat of bituminous isolation coating to metal surfaces, other than galvanized steel, which will be in contact with cementitious materials.

#### 3.3 INSTALLATION

- A. Install louvers in accordance with manufacturer's instructions and shop drawings.
- B. Coordinate louver installation with adjacent elements of building envelope to ensure watertight construction.
- C. Set units and flashings in proper location, plumb and true, free of warp or twist.
- D. Fit joints tightly; where joint sealers are to be installed, make joints of sizes required.

#### 3.4 CLEANING

- A. Wash exposed surfaces using mild detergent; thoroughly clean inside corners.
- B. Remove excess sealant by moderate use of mineral spirits or other solvent recommended by sealant manufacturer.
  - 1. Touch up marred or abraded areas of finished elements. If satisfactory touch-up cannot be accomplished, remove and replace element.

END OF SECTION

## **SECTION 235400**

### **GAS FURNACES**

#### **PART 1 - GENERAL**

- A. Provide two stage fan assisted, high efficiency gas-fired furnaces as indicated on the drawings. Units shall have components and sections arranged as indicated on the drawings. The gas-fired furnaces shall be designed for upflow or horizontal installation.
- B. The gas-fired furnaces shall be provided with proper gas burner orifices to operate on natural gas.
- C. The gas-fired furnace design shall be certified by the American Gas Association for both natural gas and L.P. gas. Burners shall be multi-port in-shot type.

#### **PART 2 - PRODUCTS**

- A. Blower motors shall be direct-drive, ECM variable speed type with "soft start" and "soft stop" for quiet operation.
- B. Units shall be equipped to operate on natural gas with a 120 volt power supply. The primary heat exchanger shall be 409 stainless steel with crimped no-weld construction. The secondary heat exchanger shall be constructed of AL29-4C stainless steel. Die-formed burners shall be constructed of aluminized steel and shall include flared ports and a stainless steel insert.
- C. Non-prorated lifetime heat exchanger limited warranty shall be provided.
- D. The unit shall include a 24-volt transformer, a two stage gas control with a regulated combination redundant gas valve. A 2-speed induced draft motor with stainless steel shaft and steel ball bearings shall be provided. Hot surface ignition system shall be used having silicon nitride ignitor. Microprocessor control system shall retain last five (5) fault codes with push button memory recall, regardless of power interruption.
- E. One inch cleanable high velocity filters shall be provided.
- F. Provide horizontal or upflow/counterflow direct expansion cooling coil for each gas furnace. Coils shall be constructed of aluminum fins mechanically bonded to 3/8" OD copper tubing. Coils shall be designed to operate on refrigerant R410a and shall be factory pressure and leak tested and shall be provided with factory-installed thermal expansion valve.
- G. Provide Little Giant #VCM-20ULS or equivalent condensate pump at each gas furnace. Pump shall deliver 25 GPH @ 15' head, 93 watt motor, 115/1/60 volts.
- H. Approved equivalent manufacturers: Rheem, Trane, Carrier

#### **PART 3 - EXECUTION**

- A. Mount wall thermostat. Provide wiring to thermostat.
- B. Provide remote sensor for unit as indicated on plans, interlock with thermostat.
- C. Adjust gas furnace fan speeds to handle the air quantity listed on the drawings.
- D. Operate gas furnaces through control sequences and measure outlet temperatures to verify proper operation.



- E. Measure fan motor current draw of gas furnaces to verify that motor is not overloaded.
- F. Extend 3/8" polyethylene discharge tubing from pump to indirect receptor or other suitable location. Interlock pump with condensing unit to de-energize cooling in event of pump failure.

END OF SECTION

## **SECTION 236200**

### **AIR COOLED CONDENSING UNITS**

#### **PART 1 - GENERAL**

##### **1.1 GENERAL**

- A. Provide air cooled condensing units as shown on the drawings and specified herein. Condensing units shall have the capacities scheduled on the drawings and shall be rated in accordance with ARI Standards.

#### **PART 2 - PRODUCTS**

##### **2.1 GENERAL**

- A. Refer to Section 232113 for component and equipment ratings. All components, fittings, equipment, coils, specialties, etc., shall meet the component pressure rating listed.

##### **2.2 AIR COOLED CONDENSING UNITS**

- A. Condensing units shall be assembled on a heavy gauge integral steel base. Units shall be weatherproofed and shall include multiple-hermetic scroll compressors, condenser coil, fans and motors, controls and holding charge of R-410a. Units shall have a hinged control access panel and removable panels which allow access to controls and motor components.
- B. Unit frame shall be one-piece welded assembly of zinc-coated steel. Exterior surfaces shall be phosphatized and finished with air-dry, gray-green enamel.
- C. Units shall have a dual refrigeration circuits. Each refrigeration circuit shall have an integral subcooling circuit.
- D. Units shall have direct drive, 3,600 rpm, scroll compressors having only three major moving parts. Motor shall be suction gas cooled. Sensors shall be embedded between the three motor windings to protect against excessive winding temperatures.
- E. Condenser fans shall be vertical discharge, direct drive fans, statically and dynamically balanced, with zinc-plated steel blades and hubs. Motors shall be three phase with permanently lubricated ball bearings, built-in current, and thermal overload protection.
- F. Condenser coils shall consist of configured aluminum fin secondary surface mechanically bonded to primary surface of 3/8 inch OD seamless copper tubing, and shall have subcooling circuits and liquid accumulators. Coils shall be factory tested at 450 psig air pressure and vacuum dehydrated. Hail guard shall be provided to protect condenser coil surface.
- G. Options shall include factory installed head pressure control damper for operation down to 0° F.
- H. Manufacturer shall provide 5 year compressor warranty which shall cover both parts and labor.
- I. Condensing units shall be Rheem, Trane, or Carrier.

## PART 3 – EXECUTION

### 3.1 INSTALLATION

- A. Air cooled condensing units shall be installed level and plumb on grade mounted on 4 inch high (minimum) concrete pad.
- B. Air cooled condensing units shall be installed in strict accordance with manufacturers printed instructions.
- C. Verify that proper refrigerant charge has been made and that proper electrical voltage and phase has been connected to the unit.

END OF SECTION

## **SECTION 260500**

### **GENERAL ELECTRICAL PROVISIONS**

#### **PART 1 - GENERAL**

##### **1.1 REFERENCE TO CONDITIONS OF THE CONTRACT**

- A. The Conditions of the Contract (General, Supplementary and other Conditions) and Division 1 - General Requirements, apply to the work specified in this Division. Unless the specifications contain statements which are more definitive or more restrictive than those contained in the Conditions of the Contract, the specifications shall not be interpreted as waiving or overruling any requirements expressed in the Conditions of the Contract.
- B. No claim or additional compensation shall be entertained on behalf of or paid on account of failure to be informed of the above conditions and requirements.
- C. Should a bidder find discrepancies in or omissions from the drawings or specifications, or should he be in doubt as to their meaning, he should at once notify the Architect who shall send written instructions to bidders. If these are ignored by the Contractor, he shall be responsible for furnishing the proper or workable equipment as necessary.
- D. Before submitting a bid, bidders shall be held responsible to have visited the site of work, attend the Pre-Bid Meeting, and fully inform themselves as to existing conditions and limitations, including rules, rates and fringe benefits, travel pay, affiliation fees and transportation expense prevailing in the local labor market, and no allowance shall subsequently be made on behalf of the bidder by reason of any error on his part.
- E. Carefully examine the architectural, structural, heating, ventilating and air conditioning, kitchen, and plumbing drawings and any other contract documents. If any discrepancies occur between the drawings or between the drawings and the specifications, report such discrepancies to the Architect in writing and obtain written instructions as to the manner in which to proceed. No departures from the contract drawings shall be made without prior written approval of the Architect and Owner.
- F. Obtain any additional reference drawings and/or information required for installation prior to installing equipment.

##### **1.2 WORK INCLUDED**

- A. Provide and install a complete and operating electrical installation in accordance with these specifications and accompanying contract drawings. This shall include required labor, material, apparatus and supervision.
- B. Without limiting or restricting the volume of work and solely for convenience, the work to be performed will, in general, comprise of the following:
  - 1. Power and/or lighting panels.
  - 2. Branch wiring.
  - 3. Temporary service lighting and power.
  - 4. Wiring of equipment furnished by others and final connections to same.
  - 5. Grounding

6. Lighting fixtures, lamps and controls.
  7. Fire alarm system.
  8. Installation of equipment supplied by the Owner.
- C. Items of labor, material, and equipment not specified in detail or shown on drawings, but incidental to or necessary for the complete installation and proper operation of the several branches of work and described herein, or reasonably implied in connection herewith, shall be furnished as if called for in detail by the specifications or drawings. This includes electrical work associated with mechanical and plumbing work whether indicated on electrical drawings or not.
- 1.3 WORK NOT INCLUDED
- A. The following items of Electrical Construction are not included in this contract:
1. Certain low voltage wiring of mechanical equipment shall be done by the respective Contractor.
  2. Certain motors and equipment, such as pumps, fans, etc., shall be provided by others, complete with motor and built-in or separate controllers as covered by such contracts. The extent of work required by this Contractor in connection with the provisions of this equipment is described hereinafter under "Electrical Powered Equipment."
  3. Motors connected to driven equipment shall be set by respective Contractor furnishing same.
  4. Certain line voltage electrical apparatus such as switches, starters, controllers, transformers, etc., furnished by others shall be delivered to the curb by the Contractor furnishing the equipment, unless specifically noted otherwise. Unload and transport to installation location.
  5. Electric heating equipment.
- 1.4 DEFINITIONS AND ABBREVIATIONS
- A. Definitions
1. "Furnish" shall mean supply and deliver to project site, ready for unloading, unpacking, assembly, installation, etc., as applicable in each instance.
  2. "Install" shall be used to describe operations at project site including unloading, packing, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protection, cleaning, and similar operations, as applicable in each instance.
  3. "Provide" shall mean furnish and install, complete and ready for intended use, as applicable in each instance.
  4. "Directed" shall mean as directed by Owner prior to installation of equipment.
  5. "Indicated" shall mean "indicated on Contract Drawings".
  6. "Shown" shall mean "shown on Contract Drawings".
  7. "Section" shall mean one of the Specification Sections.
  8. "Division" shall mean one of the Specification Divisions.

9. "Article" shall mean one of the numbered paragraphs of the Specification Section.
10. "Work" or "Electrical Work" herein includes products, labor, equipment, tools, appliances, transportation and related items, directly or indirectly required to complete the specified and/or indicated electrical installation.
11. "Code" shall mean any and all regulations and requirements of regulatory bodies, public or private, having jurisdiction over the work involved.
12. "Product" used in Division 26 means material, equipment, machinery, and/or appliances directly or indirectly required to complete the specified and/or indicated Electrical Work.
13. "Standard Product" shall mean a manufactured product, illustrated and/or described in catalogs or brochures, which are in general distribution prior to the date of issue of construction documents for bidding. Products shall generally be identified by means of a specific catalog number and manufacturer's name.
14. "Wiring" shall mean fittings, conduits, wires, junction boxes, connections to equipment, splices, and other accessories required to complete the work.
15. Abbreviations and Symbols: See lists for both on drawings.
16. "This Contractor" shall mean the Contractor responsible for Division 16 work.
17. Contract Documents: drawings, specifications, bid forms, addendum, and change orders.
18. Whenever the phrases "approved by the Architect or Owner," "approved equivalent," or "equivalent to" appear in these specifications, they shall be interpreted as meaning "as recommended by the Architect and approved by the Authority."

B. Reference to the following codes and standards shall mean:

<u>Reference</u>	<u>Definition</u>
NEC	National Electrical Code Current Edition
ASTM	American Society for Testing Materials
NEMA	National Electrical Manufacturers Association
ANSI	American National Standards Institute
FS	Federal Specification, US Government
CS	Commercial Standards issued by US Department of Commerce
NESC	National Electrical Safety Code
NETA	National Electrical Testing Association
ADA	Americans with Disabilities Act

1.5 CODES, PERMITS, AND INSPECTIONS

- A. Electrical work, equipment, and materials furnished and installed under this contract shall conform to the requirements of the Power Company, the latest edition of the National Electrical Code, the National Fire Protection Association, and any other governmental or local authorities having jurisdiction. Pay any fees required for the installation of Division 26 work. Certificates of approval shall be obtained in duplicate from any department or agency issuing same, and shall be turned over to the Owner at the completion of the work.

- B. Provide any labor, materials, services, apparatus and drawings required to comply with applicable laws, ordinances, rules and regulations, whether or not shown on the drawings and/or specified.
- C. Obtain certificates of inspection and approval from authorities having jurisdiction and deliver same to Owner as a prerequisite for final acceptance of the work. Provide record copies of permit applications, permits and other items for which certification is indicated.

#### 1.6 SPECIAL ENGINEERING SERVICES

- A. In the instance of complex or specialized electrical systems such as fire alarm, or similar miscellaneous systems; the installation, final connections and testing of such systems shall be made under the direct supervision of competent authorized service engineers who shall be in the employ of the respective equipment manufacturer. Provide the Owner with copies of instruction manuals and booklets for each system and piece of equipment installed. Provide any additional instructions to the Owner over and above that listed above in the care, adjustment and operation of parts of the electrical systems.
- B. Pay any and all expenses incurred by these equipment manufacturers' representatives.

#### 1.7 SUBMITTALS

- A. Shop drawings, product data, and samples shall be submitted to the Architect for approval.
  - 1. Shop drawings shall be new drawings, and not reproductions or tracings of the Contract Documents. In preparing shop drawings, establish lines and levels for the work specified, and check the drawings to avoid interference with structural features and other work. Immediately call to the attention of the Engineer any interferences for clarification in writing.
  - 2. Manufacturer's literature and data sheets shall be submitted indicating the necessary installation dimensions, weights, materials, and performance information. Each piece of literature shall be identified with the specific specification number, paragraph, and equipment schedule identification.
  - 3. Layout and detail drawings shall be submitted in the form of a sepia reproducible and paper prints. Manufacturer's drawings shall be standard drawings. Equipment shop drawings shall show specific data and other special features required for review consideration.
  - 4. Equipment shop drawings (8-1/2 by 11 inch sheets) shall be bound together in sets, in loose leaf binders, and shall be indexed in accordance with Specification Section. Additional shop drawings may be submitted at a later date for insertion therein, and the original submittal shall note which shop drawings shall be submitted later. Marked-up catalogs are not acceptable, and shall be rejected.
  - 5. Materials and equipment shop drawings shall be submitted within 30 calendar days of Contract receipt.
  - 6. Manufacturers' instruction manuals shall be submitted together with shop drawings. Furnish instruction manuals and parts listed for each piece of electrical equipment, on 8-1/2 by 11 inch sheets, or catalogs, suitable for loose leaf side binding, packaged separately, and clearly identified. Instructions shall include information pertaining to installation, operation, and maintenance of

equipment as applicable. Each piece of literature shall be clearly identified with the specific job equipment identification. Literature shall be factory printed and not reproduced copies.

7. Any characteristic of any piece of equipment which deviates from the characteristics of the equipment specified shall be hi-lighted and circled in red.

B. Submit manufacturers' data, and/or shop drawings of the following:

1. Lighting and Power Panels and Cabinets
2. Wiring Devices
3. Lighting Fixtures
4. Fire Alarm System
5. Distribution Equipment

1.8 OPERATING AND MAINTENANCE INSTRUCTIONS

- A. After final tests and adjustments have been completed, furnish the services of qualified personnel to fully instruct representatives of the Owner in the operation and maintenance procedures for equipment installed. Operation and maintenance instructions for major items of equipment shall be directly supervised by the equipment manufacturer's representative. Supply qualified personnel to operate equipment for sufficient length of time as required to meet governing authorities' operation and performance tests and as required to assure that the Owner's representatives are properly qualified to take over operation and maintenance procedures.

1. Notify the Architect, the Owner's representatives and equipment manufacturers' representatives, by letter, as to the time and date of operating and maintenance instruction periods at least one week prior to conducting same.
2. Forward to the Architect the signatures of all present for the instruction periods.

- B. Furnish three (3) copies of recommended equipment operation and maintenance procedures manuals as specified herein, assembled and bound together in 8-1/2 by 11 inch three-ring binders. The ring binders shall be submitted to the Architect in accordance with procedures established for shop drawing submittals.

1. The operation and maintenance procedures manuals shall include the following:
  - a. Project Title
  - b. Architect's Name and Address
  - c. Date Submitted
  - d. Contractor's Name and Address
  - e. Index (in alphabetical order, with page numbers)
  - f. General Description of Each System
  - g. Parts List, identifying the various parts of equipment for repair and replacement purposes.
  - h. List of spares recommended for normal service requirements.
  - i. Operating instructions outlining step-by-step procedures required for system start-up and operation. The instructions shall include the



manufacturer's name, model number, service manual, and brief description of each piece of equipment and its basic operating features.

- j. Maintenance instructions describing routine maintenance and lubrication procedures and schedules, and simplified diagrams which illustrate the systems as installed.
- k. Wiring and control diagrams for each piece of equipment, showing "as installed" conditions.

#### 1.9 SINGULAR NUMBER

- A. References made to any item in the singular number shall apply equally to as many identical items that the work may require.

#### 1.10 PROTECTION OF SERVICES

- A. Repair, replace and maintain in service any new or existing utilities, facilities or services (underground, overground, interior or exterior) damaged, broken or otherwise rendered inoperative during the course of construction. The method used in repairing, replacing or maintaining the services shall be approved by the Owner and Architect.

#### 1.11 PROTECTION OF FLOORS

- A. Protect existing flooring from damage during the construction period. Provide plywood or similar material under equipment or materials stored on floors, and in areas where construction may damage the floor surfaces. Replace floor surfaces (including sealer) damaged during the construction.

#### 1.12 TEMPORARY LIGHT AND POWER SERVICES

- A. Refer to the Division 1, General Requirements, of these specifications to determine responsibility for temporary lights, power, water and heat.
- B. The Electrical Contractor is responsible for all temporary power and lighting requirements throughout construction. The Electrical Contractor shall review all associated phasing plans and schedules and provide any and all equipment, either temporary or permanent, required to maintain or provide temporary power and lighting to all areas of this facility, throughout the construction process.

In addition to minimal temporary lighting and power needed for construction operations, areas that will be Owner-occupied throughout construction shall be provided with temporary power and lighting services that meet or exceed the existing services that currently serve these areas.

- C. The electrical documents indicate the final arrangement for the power/lighting/communication/ signal/data systems and do not reflect equipment, devices, etc., needed to provide the required temporary power and lighting services.
- D. At the completion of this project, all temporary lighting, temporary receptacles, and temporary wiring shall be removed in their entirety.

#### 1.13 SUBSTITUTIONS

- A. It is the intent of these specifications that wherever a manufacturer or product is specified, and the term "or approved equivalent" is used, the substituted item must conform in respects to the specified item. Consideration shall not be given to claims that the substituted item meets the performance requirements with lesser construction.

Performance indicated in schedules, drawings and specifications shall be interpreted as minimum performance.

- B. Note that where specific manufacturers' products are indicated in the Contract Documents, the associated systems have been designed on the basis of that product's physical characteristics. Where specific manufacturers' products are indicated in the Contract Documents and other manufacturers' names are listed, the associated systems have been designed on the basis of the first-named manufacturer's product. When products other than those used as the basis of design are provided, pay additional costs related to modifications to the systems and/or structure required by the use of that product.
- C. Equipment of one type shall be the products of one manufacturer; similar items of the same classification shall be identical, including equipment, assemblies, parts and components.
- D. Materials furnished shall be determined safe by a nationally recognized testing organization, such as Underwriters' Laboratories, Inc., or Factory Mutual Engineering Corporation, and materials shall be labeled, certified or listed by such organizations.
- E. Where a specific manufacturer is specified and other manufacturers' names are listed as equivalent, the bid shall be based upon the specified or equivalent manufacturers only. Any substitutions from the specified or equivalent manufacturers shall be offered as a Bidder's Initiative.
- F. Final acceptance of substitutions shall be at the discretion of the Architect/Engineer.

#### 1.14 PERFORMANCE OF EQUIPMENT

- A. Materials, equipment and appurtenances of any kind, shown on the drawings, hereinafter specified or required for the completion of the work in accordance with the intent of these specifications, shall be completely satisfactory and acceptable in operation, performance and capacity. No approval either written or verbal of any drawings, descriptive data or samples or such material, equipment and/or appurtenance shall relieve the Contractor of his responsibility to turn over the same to the Owner in perfect working order at the completion of the work.
- B. Any material, equipment or appurtenances, the operation, capacity or performance of which does not comply with the drawings and/or specification requirements or which is damaged prior to acceptance by the Owner shall be held to be defective material and shall be removed and replaced with proper and acceptable materials, equipment and/or appurtenances or put in proper and acceptable working order, satisfactory to the Architect and Owner, without additional cost to the Owner.

#### 1.15 WEATHERPROOFING LOCATIONS (WP)

- A. Electrical apparatus, such as outlet boxes, switches, thermal switches or manual starters, disconnect switches, combination switches and starters, motor control centers, and motor starters shall be weatherproof gasketed type, NEMA Types 3 or 4 in the following instances:
  - 1. On surface of exterior face of building, including areas where not under canopies, cast boxes with threaded hubs must be used and under canopies steel boxes with gasket connections to devices.
  - 2. In any areas where specifically noted "WP" or required by the NEC or Electrical Regulations mentioned herein.

3. Within air conditioning enclosures.
4. In underground splice boxes.
5. On building roof.

#### 1.16 CLEANING, PROTECTING AND ADJUSTING

- A. Materials shall be stored in a manner that shall maintain an orderly, clean appearance. If stored on-site in open or unprotected areas, equipment and material shall be kept off the ground by means of pallets or racks, and covered with tarpaulins.
- B. Equipment and material, if left unprotected and damaged, shall be repainted or otherwise refurbished at the discretion of the Owner. Equipment and material is subject to rejection and replacement if, in the opinion of the Architect or the manufacturer's engineering department, the equipment has deteriorated or been damaged to the extent that its immediate use or performance is questionable, or that its normal life expectancy has been curtailed.
- C. During the construction period, protect ductwork, raceways, conduit and equipment from damage and dirt. Properly cap ductwork and conduit.
- D. Vacuum cabinets, switch boards, distribution panels, lighting and power panels, etc., after completion of work.

#### 1.17 ACCESSIBILITY

- A. Coordinate to ensure the adequacy of the size of shafts and chases, and the adequacy of clearances in hung ceilings and other areas required for the proper installation of this work.
- B. Locate equipment which must be serviced, operated or maintained in fully accessible positions. Equipment requiring access shall include, but is not necessarily limited to, motors, junction boxes, fire dampers, controllers and switchgears.
- C. Provide, as required, the exact locations of access doors. Provide access doors in finished construction for installation by others. Locations of access doors in finished construction shall be submitted in sufficient time to be installed in the normal course of the work. Keep conduit and other electrical devices clear of access door openings to allow adequate space to work in or enter the concealed space.
- D. Access panels shall not be smaller than 12 inches by 16 inches and shall be all-steel construction with a No. 16 gauge wall or ceiling frame and a No. 14 gauge panel door with not less than 1/8 inch fireproofing secured to the inside of the door. Doors shall be provided with concealed hinges and be secured with suitable clips and countersunk screws. Outside of access panels shall finish flush with finished wall or ceiling surfaces. Covers shall be factory primed with two (2) coats of primer.

#### 1.18 GUARANTEE

- A. Guarantee material, equipment and workmanship for a period of one (1) year from date of final acceptance by Architect and Owner. Replace defective material and workmanship furnished and installed and other work and equipment damaged thereby.
- B. In addition to the one (1) year guarantee, furnish any warranties or guarantees that normally come with specific pieces of equipment that exceed the one (1) year guarantee. These additional warranties shall be given to the Owner for the time period specified.

#### 1.19 OWNER COORDINATION

- A. Coordinate any and all activities with the designated Owner's representative, which involves a tie to existing electrical systems or which, in any way, may interfere with or interrupt existing electrical systems. Where there are scheduled ties or interruptions or where there is a reasonable chance of interruption, written notice must be obtained from the Owner prior to work commencing.

#### 1.20 COORDINATION

- A. Coordinate and furnish in writing to others, including the Architect, any information necessary to permit the work of all contractors to be installed satisfactorily and with the least possible interference or delay.
- B. Because of the complexity of the construction of this project, each Contractor shall participate in the preparation of coordination drawings. The procedure shall be supervised by the Construction Manager. No installation of permanent systems shall proceed until the coordination drawings are approved by the Construction Manager and the Architect. No extra charges shall be allowed for changes required to accommodate installation of system by other contractors.
- C. Coordination drawings shall be prepared for each floor level and shall be of a scale not less than 1/4 inch - 1 foot. Coordination drawings shall include equipment, lighting, conduit and raceway plans, and elevations with dimensions. Coordination drawings shall also include required access points through ceiling panels, access doors, cover plates, etc.
- D. Devices and appurtenances which are to be installed in finished areas shall be coordinated with the Architect for final approval as it relates to location, finish, materials, color, and texture.
- E. When work is installed without proper coordination, changes to this work deemed necessary by the Architect shall be made to correct conditions without any extra cost to the Owner.

#### 1.21 PRE-BID SITE VISIT

- A. Bidders shall visit the site and become completely familiar with existing conditions prior to submitting their bid. No extra charges shall be allowed as a result of existing conditions.

### PART 2 - PRODUCTS

#### 2.1 MATERIALS AND WORKMANSHIP

- A. Equipment shall be so built and installed as to deliver its full rated capacity at the efficiency for which it was designed. Equipment shall meet the detailed requirements indicated, and shall be suitable for the installation shown.
- B. Where two or more units of the same class of equipment are furnished in same Section of Specifications, provide each from the same manufacturer. Furnish equipment and materials new and free from defects of size, make, type and quality herein specified, or as reviewed. Work shall be installed in a neat and workmanlike manner.
- C. Capacities, dimensions, or sizes specified or indicated are minimum, unless otherwise stated. Tolerances used in rating or testing standards specified shall not be allowed in determining capacities of equipment.

- D. Materials shall be listed by the Underwriters' Laboratories, Inc. where applicable and shall be manufactured in accordance with applicable standards established by ANSI, NEMA, ASTM, and IEEE.
- E. Any products judged not in accordance with the Specifications either before or after installation shall be rejected.
- F. Where products are specified with no reference to a particular manufacturer's product, the product used shall meet or exceed industry construction and testing procedure standards applicable to the product, for life expectancy, performance and safety.
- G. Where electrical products are a fabricated assembly, the fabricator shall assume responsibility for correct operation of the entire assembly and of its individual components.
- H. Tools: Provide special tools for proper operation and maintenance of the equipment.

## 2.2 IDENTIFICATION

- A. Switchgear, panels, relays, terminal control cabinets, junction boxes, contactors, circuit breakers, safety switches, motor starters, and similar items shall be identified with a single plastic nameplate made up of two laminated black plastic sheets bonded with a middle sheet of white plastic and characters engraved in one black sheet to the depth of the white plastic. Nameplate shall read as follows:
  - 1. First line shall be 1/2 inch letters stating panel/equipment name.
  - 2. Second line (if applicable) shall be 1/4 inch letters stating the existing panel name in parentheses ( ).
  - 3. Third line shall be 1/4 inch letters stating voltage/phase.
  - 4. Fourth line shall be 1/4 inch letters stating breaker number, panel number, and room name/room number (Owner's room number) from which it is fed.
  - 5. Fifth line shall be 1/4 inch letters stating function and/or equipment which it controls.
- B. A typewritten list of nameplates shall be submitted to the Owner and the Architect for approval before ordering same.
- C. Label receptacle plates with identification showing panel and breaker number from which it is fed. Labels shall be made using the Dymo Posiprinter System.
- D. Label junction boxes and pull boxes, showing circuit numbers contained in the enclosure. Use an approved marking device.
- E. Label wire with an identification tag showing panel and breaker number from which it is fed at splices, junctions, and terminations as explained in this specification.
- F. Label fire alarm device bases with identification showing device address number assigned by fire alarm system manufacturer. Labels shall be made using the Dymo Posiprinter system.

## 2.3 ANCHOR BOLTS

- A. Provide and set in place, at the time of pouring of concrete foundations, necessary anchor bolts as required for the equipment called for under these specifications. Anchor bolts shall be of the hook type, of proper size and length to suit the equipment. Anchor bolts shall be set in pipe sleeves of approximately twice the bolt diameter and

one half the embedded length of the bolt. Assume full responsibility for proper emplacement of the bolts.

## 2.4 INSERTS

- A. Provide inserts of an approved metallic type for hangers. Where two or more parallel conduits are installed, continuous inserts may be used. Where required to distribute the load on the inserts, a piece of reinforcing steel of sufficient length shall be passed through the insert.

## 2.5 SLEEVES

- A. Provide sleeves in all roofs, floors, and any fire-rated walls. Each sleeve shall extend through its respective floor, wall or partition and shall be cut flush with each surface unless otherwise required.
- B. Sleeves in bearing and masonry walls, floors and partitions shall be standard weight steel pipe finished with smooth edges. For other than masonry partitions, through suspended ceilings, and for concealed vertical piping, sleeves shall be No. 22 USG galvanized iron.
- C. Sleeves shall be properly installed and securely cemented in place.
- D. Floor sleeves shall extend 1 inch above the finished floor, unless otherwise noted. Space between floor sleeves and passing conduit shall be caulked with graphite packing and waterproof caulking compound.
- E. Where conduits pass through waterproofed floor or walls, design of sleeves shall be such that waterproofing can be flashed into and around the sleeves.
- F. Where conduits pass through roofs, sleeves shall be installed and flashed and made watertight by the General Contractor unless otherwise specified or shown on the drawings.
- G. Sleeves through exterior walls below grade shall have the space between conduit and sleeve caulked watertight using an approved method.

## 2.6 FIREPROOFING

- A. Where sleeves or other penetrations pierce floors or walls having specific fire ratings, the space between the sleeve and passing conduit shall be fireproofed using 3M Series 7900 Penetration Fire Stop putty. Where a cable tray passes through fire-rated walls, use seal bags as manufactured by International Protection Coatings Company. Installation method shall be per manufacturer's recommendations and approved by the Architect/Engineer.

## 2.7 WIRE GAUGE

- A. The sizes of conductors and thickness of metals shown on the drawings or mentioned herein shall be understood to be American Wire Gauge.

## 2.8 MISCELLANEOUS METAL AND STRUCTURAL STEEL

- A. Scope of Work: Furnish labor, materials, equipment and services necessary for the installation of miscellaneous metal and structural steel work required to complete this contract. Erect structural steel required for the proper support of equipment required under this contract.
- B. Supports, brackets, and clamps and other items specified herein shall be installed in strict accordance with the best practices and recognized code.

- C. Materials: Structural steel members required under this part shall conform to ASTM Standard Specification A-7. Other materials shall be as specified hereinafter.
- D. Priming: steel and iron work shall be primed with Rust-Oleum 769 or approved equivalent. Before priming, metal shall be thoroughly cleaned free from scale, rust and dirt.
- E. Anchors: Provide anchors, bolts, screws, dowels and connecting members, and do cutting and fitting necessary to secure the work to adjoining construction. Build in connecting members to masonry, concrete and structural steel as the work progresses.
- F. Supports and Brackets: shall be neatly constructed to structural shapes to adequately support the equipment intended. Supports must be approved prior to installation. Attention is directed to the proper rigid support required for conduit. Field conditions shall regulate the type of support required.

#### 2.9 VIBRATION ISOLATION MOUNTS

- A. Provide vibration isolation mounts for all substations, power centers, transformers, etc. All vibration isolation mounts shall be Amber-Booth spring type applicable for the size and weight of the equipment.

#### 2.10 GRADING, FERTILIZING, AND SEEDING

- A. Provide labor, materials, equipment, and services required to strip and store topsoil, replace topsoil, and rough and finish grade and fertilize and seed areas disturbed beyond the work area of the General Contract. Topsoil must be stored where directed on the site.

#### 2.11 BITUMINOUS PAVING

- A. Provide labor, materials, equipment, and services necessary to repair pavements disturbed under the Contract.
- B. Materials, methods, and workmanship shall conform with the requirements of the PA Department of Highways, as published in its specifications Form 408, as amended to date.
- C. All patching of existing areas shall match existing materials.

#### 2.12 MOTORS

- A. Motors shall be built in accordance with the latest standards of NEMA and as specified. Motors shall be tested in accordance with ASA C50 and conform thereto with respect to insulation resistance and dielectric strength.
- B. Each motor shall be provided with conduit terminal box and adequate starting and protective equipment as specified or required. The capacity shall be sufficient to operate associated driven devices under conditions of operation and load and without overload, and shall be at least the horsepower indicated or specified. Each motor type shall be for quiet operation.
- C. Motor starting equipment must be selected so that starting currents or transients do not have an adverse effect on lighting or other electrical equipment. No open transition wye-delta starting of motors shall be permitted.

## PART 3 - EXECUTION

### 3.1 GENERAL

- A. Provide information to the General Contractor for any chases or openings required under this Contract. No cutting shall be done which may affect the building structurally or architecturally without the prior approval of the Architect. Damaged construction shall be restored to its original conditions and finished to match the surrounding work. Refer to "Supplementary General Conditions" for the disposition of Cutting and Patching.
- B. Grades, elevations, and dimensions shown on the drawings are approximately correct; however, field check and otherwise verify such data at the site before proceeding with the work. Make necessary survey equipment available at all times and make use of such equipment wherever necessary to properly install equipment.
- C. The Contractor shall be entirely responsible for apparatus, equipment, and appurtenances furnished by him or his subcontractors in connection with the work and special care shall be taken to protect parts thereof in such manner as may be necessary or as may be directed. Protection shall include covers, crating, sheds or other means to prevent dirt, grit, plaster or other foreign substances from entering the working parts of machinery or equipment. Special care shall be taken to keep open ends of pipes closed while in storage and during installation. Where equipment must be stored outside the building, it shall be totally covered and secured with heavy weatherproofing tarps and kept dry at all times. Where equipment has been subjected to moisture, it shall be removed from the site and replaced with new equipment. Protect open excavating until covered over.
- D. Due to the schematic nature and small scale of the electrical drawings, it is not possible to indicate exact locations, offsets, fittings, access panels, pull boxes, and miscellaneous parts which may be required to form a complete system. The drawings are generally indicative of the work to be installed. Arrange work accordingly furnishing necessary parts and equipment as may be required to meet the various conditions and to provide a complete circuit from end use device to circuit protective device in panel.
- E. The Contractor shall include in his bid price, the cost to furnish and install twelve (12) additional 20 amp circuits for each new panel shown on the drawings. Each circuit shall include up to eight (8) receptacles along with circuit breakers, conductors, ground, and conduits.
- F. Within thirty (30) days after acceptance of bids, submit to the Architect for approval, a complete list of equipment and materials to be furnished under this contract, giving names and addresses of manufacturers and material they intend to furnish. This source of supply shall be listed on forms available from the Architect.



### 3.2 CLEARANCES

- A. Take caution when on routing conduit and location of equipment. In many cases, clearances in ceiling plenums is limited due to ductwork and other mechanical lines and systems and steel. The Contractor shall be responsible for routing around mechanical equipment and ducts in order that everything can remain concealed in finished areas.

### 3.3 CUTTING AND PATCHING

- A. Provide cutting and patching necessary to install the work specified herein. Patching shall match adjacent surfaces. Refer to Section 01045, Cutting and Patching, for specific direction.
- B. No structural members shall be cut without prior approval of the Architect, and such cutting shall be done in a manner directed by the Architect.
- C. Provide ceiling removal and replacement where work above ceilings is required. Replace ceiling components damaged in the process.
- D. Provide patching where electrical devices are removed from walls, ceilings or floors as required under demolition.

### 3.4 PAINTING

- A. Finished painting shall be performed by others except for standard factory finishes.
- B. Electrical motors, pump casings, and other similar items shall be provided with three coats of machinery enamel at the factory, and shall be carefully cleaned, rubbed down, and oiled after installation.

### 3.5 LOCATIONS

- A. Apply for detailed and specific information regarding the location of equipment as the final location may differ from that indicated on the drawings. Outlets, equipment or wiring improperly placed because of failure to obtain this information shall be relocated and re-installed without additional expense to the Owner. Determine the actual direction of door swings, so that local switches and other controls shall be installed at the lockside of doors, unless otherwise noted. Improperly located switches shall be relocated without additional expense to the Owner.
- B. The design shall be subject to such revisions as may be necessary to overcome building obstructions. No changes shall be made in location of outlets or equipment without written consent of the Architect and Owner.
- C. Unless otherwise mentioned or indicated, mounting heights of outlets are shown on the drawings or in the specification. Dimensions given shall be considered to be from center of outlet to finished floor.
- D. Coordinate the exact location and elevation of all electrical devices and fixtures with the architectural interior elevation plan and reflective ceiling plan prior to installation.
- E. Properly rough for the electrical conduit and equipment under this contract and modify as required for coordination during the construction period.

### 3.6 DUST, DIRT AND NOISE

- A. Carry out new work and make changes, relocations, and installations with a minimum of noise. Site areas and new equipment, floors and walls, shall be adequately protected from dust and dirt caused by the work. Protection shall include suitable

temporary barriers or coverings. The exterior and interior premises of each building shall be kept clean as possible during construction. Damages to surfaces or equipment as a result of negligence shall be replaced or corrected as required.

### 3.7 RECORD DRAWINGS

- A. During the construction period, maintain in good order a complete set of blue line electrical contract drawings. Record the actual electrical installation as the work progresses. Include changes to the contract and to equipment sizes and types. Keep these drawings available at the site at all times for inspection.
- B. Take proper caution against the use of superseded drawings. Check such copies and mark "void." Where drawings have been corrected by memorandum, assume the responsibility for marking all drawings so affected with the changes; such marked drawings shall remain in use until revised drawings are issued.
- C. At the conclusion of the work, obtain a set of sepias from the Architect. Incorporate "as built" data in a clearly legible manner. Return such marked prints or sepias within 30 days to the Architect.
- D. At the conclusion of the work, provide to the Architect a complete set of drawings which indicate precisely how the electrical single line and riser diagram equipment has been installed. Return such reproducible drawings within 30 days to the Architect.

### 3.8 EQUIPMENT, FOUNDATIONS, SUPPORTS, PIERS AND ATTACHMENTS

- A. Provide necessary foundations, supports, pads, bases and piers required for equipment specified in this division; submit drawings in accordance with Shop Drawing Submittal requirements prior to the purchase, fabrication or construction of same.
- B. Provide concrete pads for base-mounted transformers and rotating equipment, and for floor-mounted equipment located in equipment rooms and as indicated on the drawings. Pads shall be extended 6 inches beyond matching base in all directions with top edge chamfered. Inset 6 inch steel dowel rods into floors to anchor pads.
- C. Construction of foundations, supports, pads, bases and piers, where mounted on the floor, shall be of the same materials and same quality of finish as the adjacent and surrounding floor material.
- D. Equipment shall be securely attached to the building structure in an approved manner. Attachments shall be of a strong and durable nature and any attachments that are, in the opinion of the Architect, not strong and durable shall be replaced as directed.

### 3.9 SCAFFOLDING

- A. Furnish and erect scaffolding and ladders required in the installation of wiring, equipment and fixtures.

### 3.10 ENVIRONMENTAL AIR PLENUMS

- A. In spaces over hung ceiling which are used for environmental air handling purposes as defined by Article 300.22C of the National Electric Code, power data and communications cable must be in conduit or of the type cable rated for air plenum use. Cable type and/or raceway is generally indicated on the electrical drawings and specifications although the Contractor shall be responsible to clearly define ceiling space used for environmental air purposes.

END OF SECTION

## **SECTION 260519**

### **WIRES AND CABLE**

#### **PART 1 - GENERAL**

##### **1.1 DESCRIPTION**

- A. Provide wires and cables in accordance with the Contract Documents.
- B. This section includes cable requirements for systems below 600 volt insulation.
- C. Conductors shall be soft drawn copper having conductivity not less than 98 percent.
- D. No aluminum conductors or lugs or splicing devices shall be permitted.
- E. All wiring and cables shall be installed in raceway unless otherwise noted.

#### **PART 2 - PRODUCTS**

##### **2.1 600 VOLT WIRE**

- A. Insulation and conductor types shall be as follows:
  - 1. Conductors shall have a 600 volt insulation 90°C heat resistant type THHN.
  - 2. All wire shall be stranded, unless otherwise noted.
- B. Manufacturers:
  - 1. Cablec Continental Cable Company
  - 2. Pirelli Cable Corporation
  - 3. Southwire Corporation
  - 4. The Okonite Company

##### **2.2 TYPE MC CONDUCTOR CABLE**

- A. Conductors connecting receptacle and switch circuits in partitions to lighting and power grid boxes in finished areas only, in accordance with the NEC, may be 3-, 4-, or 5-wire, Type MC, consisting of #12 AWG copper THHN insulated phase conductors and one full size green insulated conductor, where acceptable to the authority having jurisdiction. Ground conductor shall be terminated to grounding system as required by NEC and authority having jurisdiction. All conductors shall be stranded, unless otherwise noted, and shall be enclosed in the flexible steel armored cover.
- B. Manufacturers:
  - 1. AFC/A Nortek Company
  - 2. Rome Cable Company
- C. Permitted Uses
  - 1. From building wiring junction box to each light fixture in lengths not to exceed 6 feet.
  - 2. Branch circuit wiring to room electrical devices.

##### **2.3 PLENUM CONDUCTOR CABLE**

- A. Plenum conductor cable may be used for NEC Class 2 or 3 wiring if conductor cable is UL listed in accordance with UL 910 and UL 1820 and is installed in accordance with the NEC and is acceptable to the Authority having jurisdiction. Insulation types, UL listing, and written acceptance by the local authority shall be submitted for review.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Provide circuit wiring complete as shown on the drawings, and as hereinafter specified or required. The minimum size of wire for branch circuits shall be No. 12, except 120 volt circuits over 100 feet in length shall be No. 10; 120 volt circuits over 150 feet in length shall be No. 8. Wiring shall be increased in size if so demanded by wattage of load.
- B. 600 volt wiring shall be color coded. Consistent phase identification of wires from service feeders to branch circuit wires shall be maintained as follows:
  - 1. 120/208 volts - Normal - Phase A..... Black
  - 2. 120/208 volts - Normal - Phase B..... Red
  - 3. 120/208 volts - Normal - Phase C ..... Blue
  - 4. 120/208 volts - Neutral ..... White
  - 5. 120/208 volt - Ground Wire ..... Green
- C. Fire alarm wiring color coding shall be per manufacturer's recommendation or as directed by the Owner to match existing.
- D. Do not pull wires into raceways until raceways are permanently in place and termination points are not subject to damage.
- E. Do not use uninsulated wire conductors.
- F. Provide excess free conductor end length at termination points, adequate to make up splices and terminations, permitting neatly training conductors, and in any case not less than:
  - 1. No. 14 through 10 AWG - 6 inches
  - 2. No. 8 or 6 AWG - 10 inches
  - 3. Larger than No. 6 AWG - 18 inches
- G. Support vertical cables as required by Code. Use lock type cable support bushings having internal wedges and retaining collars. Locate support points in readily accessible pull boxes sized to code requirements.
- H. Circuit wiring in cabinets, panels, pull boxes, etc., shall be tied and held with Thomas & Betts Nylon Self-Locking Ty-Raps, or approved equal.
- I. Equip large pull, junction or terminal boxes with suitable racks to support, arrange, and retain wire and cable in an orderly manner.
- J. Equip conductors smaller than No. 4 AWG, in wireways, gutters, pull boxes, terminations, etc., with Thomas & Betts E-Z-code wire markers. Designate panel and circuit number on each individual marker.

- K. Equip conductors No. 4 AWG or larger size, and feeder conductors with metal, fibre or fireproof linen tags or with wrap around markers. Designate panel circuit number on each individual marker. In addition, designate use of each set of conductors on a common tag or on each individual conductor marker. Tagging shall include panel source and feeder size of equipment supply.
- L. Where the single pole work is used on branch circuits, circuit wiring may be grouped in accordance with the NEC. The drawings are schematic and diagrammatic and indicate the general method of installing circuit wiring and the outlets which are to be supplied.
- M. Lighting and convenience outlet circuiting are indicated on the drawings separately as single pole work for clarity; however, grouping circuits in accordance with the NEC and connecting to circuit boxes at any convenience point as required by the NEC, providing a minimum of 20 percent spare future capacity in each raceway, is permitted.
- N. The minimum sizes of wire on an installation shall be as follows:
  - Lighting and Power Circuits ..... 12 AWG
  - Signal Circuits - with common or individual leads ..... 14 AWG
  - Remote Control Leads ..... As recommended by  
manufacturer
  - Low Voltage Light Control, Intercom, ..... Twisted Pair, Non-Shielded or  
Nurse Call, and Fire Alarm Systems ..... Shielded as shown on drawings  
or recommended by  
manufacturer
  - Fixtures ..... 14 AWG Min. and as required by  
Underwriters Laboratories
- O. Install in each empty interior conduit, one nylon measuring fish line for the future installation of wire and cable.
- P. Great care shall be exercised in pulling wires into the conduits so as not to injure the insulation. Only UL approved lubricants shall be used to assist in the pulling in of wires with an outer covering or braid.
- Q. Where switch boxes are used as the termination of the "home runs" in addition to the switch legs, not less than a two-gang box shall be used, in order to provide ample room for wiring.
- R. Branch lighting circuits feeding exterior yard lights and parking lot lights shall be direct burial cable type UF moisture resistant with 600 volt insulation. Where drawings indicate use of conduit, the cable feeding these lights shall be pulled in rigid steel conduit and shall utilize standard type THHN wire. This conduit shall not require a concrete envelope, however, it shall have each joint sealed watertight with a suitable mastic and sealing compound. Install the cable feeding exterior in PVC conduit with a concrete envelope as described elsewhere in the specifications in "Underground Raceways."
- S. The size and general location of the various feeders are shown on the drawings; however, determine the exact location and routing of feeders at the site.
- T. Communications, sound and other low voltage wiring shall be of size and insulation recommended by the manufacturer of the equipment being served.

- U. In every pull or splice box and all other places where wires and cables may not be readily identified by nameplate on the equipment to which they connect, each circuit shall be identified with a permanent identification tag securely fastened to the conductors. Conductors of a feeder or branch circuit shall be laced together prior to tagging. Identification tags shall have the number of conductors, gauge and circuit identification stamped thereon in 1/4 inch high letters. Tags shall be made of a non-metallic material and shall be approved before installation.
- V. Where Type MC conductor cable is used, provide proper support from building structure or install in "power" section of cable tray.
- W. Each 120 volt designated circuit shall have its own individual full size neutral and insulated equipment ground throughout the circuit.

END OF SECTION

## **SECTION 260526**

### **GROUNDING**

#### **PART 1 - GENERAL**

##### **1.1 DESCRIPTION**

- A. Provide all system equipment and static grounding in accordance with the Contract Documents and in full compliance with Article 250 of the National Electric Code 2014 Edition, and local codes.
- B. Ground every device and metal part of the electrical system.
- C. Maintain continuity of system and equipment grounds throughout the electrical installation unless specifically shown otherwise. Provide ground bushings and jumpers where normal metallic ground paths are interrupted.
- D. Grounding shall be accomplished by means of a grounding triod as indicated on the drawings and generally outlined in the subsequent paragraphs. In addition, grounding shall be connected to the city water feed.
- E. All electrical equipment, cabinets, boxes, conduit and metal raceways shall be grounded in accordance with the NEC, NFPA 99 and as shown on the drawings and as specified herein.
- F. All connections to apparatus and conduits shall be made with an approved type of solderless connector. Connectors shall be securely bolted or clamped to the equipment. All contact surfaces shall be thoroughly cleaned and bright before connections are made in order to insure a good metal-to-metal contact.
- G. All underground cable splicing shall be thermite welded.
- H. Tie all grounding systems together at their origins as shown on the Drawings and as called for by the NEC.
- I. Provide an insulated ground wire sized in accordance with the NEC in every conduit carrying 100 amps or over, whether or not it is shown on Drawings.
- J. A solid ground shall be provided for the complete conduit system, feeder neutrals, motor frameworks, transformer cases, neutral of 480 volt and 208 volt building service, heating equipment enclosures, and other items as required.

##### **1.2 GROUNDING TRIOD**

- A. Driven rod assembly shall consist of four (4) ground rods with three (3) spaced 6 feet apart forming an equilateral triangle and one (1) in the center.
- B. One of the rods shall be equipped with a clamp at the top to accommodate a No. 4/0 bare stranded copper ground cable to the system ground base. A No. 4/0 bare stranded copper cable shall circle the three rods and be brazed to each rod. Cable shall tie into system neutrals and switchgear cases, and other metallic parts as required.
- C. Upper portions of the ground rods shall be located near the surface. Cables connecting ground rod assemblies shall be installed 2 feet below grade. Grounding conductors shall be installed in such a manner as to allow the shortest and most direct path between equipment and ground.

### 1.3 CITY WATER PIPE CONNECTION

- A. The supplemental grounding system shall be comprised of a common ground bus cable interconnected to an acceptable metallic cold water service pipe. The water pipe connection shall be made with a clamp type ground fitting that bonds the cable to the water pipe. Around the water meter, a bonding jumper shall be installed and connected by means of approved ground clamps.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. Ground conductors shall be of size indicated or required by code and type/manufacturer as listed in Section 16120, Wires and Cables.
- B. Ground rods shall be copper-clad steel, 3/4 inch diameter and 10 feet long.
- C. Connectors shall be as manufactured by Burndy, O.Z. Gedney, or Erico.
- D. Exothermic welding shall be Erico, Burndy, or O.Z. Gedney.
- E. Accessible connections shall be made with multiple bolt silicon bronze connectors specifically designed and approved for the connection to be made.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. The neutral wire for the electrical system shall not be used to ground miscellaneous conduits.
- B. Ground wires required by the National Electrical Code and/or the utility company.
- C. The resistance between the grounding system and absolute earth shall not exceed 10 ohms and shall be measured in the presence of the Architect's representative.
- D. The equipment grounding terminal bars of the normal and essential electrical system panel boards shall be bonded together with an insulated continuous copper bonding jumper not smaller than No. 4 copper.

### 3.2 EQUIPMENT GROUNDING

- A. Cable shielding, metallic conduits, wireways, metal enclosures of busways, cable boxes, electrical equipment housings and all noncurrent carrying metallic parts shall be grounded. Run a separate ground wire to all equipment.
- B. All conduit stub-ups shall be grounded and where multiple stub-ups are made within an equipment enclosure, such as a switchboard, they shall be equipped with grounding bushings and bonded together and to the enclosure and the enclosure ground bus.
- C. Provide bonding devices, fittings or jumpers at expansion fitting, isolation sections or wherever continuity of ground is broken.
- D. Install all grounding conductors with sufficient slack, to avoid breaking due to settlement or movement of conductors or attached points.
- E. Motors shall be grounded by means of a grounding conductor in the same raceway with the motor feeder connected to a grounding bushing at the motor terminal box and the ground bus in the motor control center or to the incoming conduit grounding bushing of an individually mounted motor starter.



- F. Where flexible conduit is used for all or part of a conduit run, except lighting branch circuits, a grounding conductor shall be provided in the conduit and connected to grounding bushings at each end of the run.
- G. Under no circumstances shall a neutral conductor or neutral bar in an enclosure be grounding.

### 3.3 FEEDER GROUNDING

- A. Run a separate insulated ground for feeders.
- B. Size grounds in accordance with the NEC or as noted on the drawings.

END OF SECTION

## **SECTION 260529**

### **HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS**

#### **PART 1 - GENERAL**

##### **1.1 DESCRIPTION**

- A. Provide products to suspend, attach, support and otherwise retain in location, electrical work.
  - 1. The specified requirements herein include support and hardware information of a general nature. Where additional requirements are stated elsewhere in the specification related to specific products and conditions, such additional requirements shall supersede these general specifications.
- B. Approvals: Obtain approval before cutting, drilling, or welding to, structural members. Where cutting, drilling, or welding is permitted, this work, as required for product support, is a part of product installation electrical work.
- C. Welding: Use certified welders for welded installation. Steel in weld area shall be cleaned before and after welding operations, and refinished after welding.
  - 1. Do not weld raceway pipe straps to structure.
- D. Use electrically driven MG set for welding. No solid state welders shall be permitted.

#### **PART 2 - PRODUCTS**

##### **2.1 MATERIALS**

- A. Use expansion shield anchors or toggle bolts of the following manufacturers.
  - 1. Phillips Drill Company, Inc. "Red Head Self Drilling"
  - 2. Rawl Products Company "Saber Tooth"
  - 3. McCulloch Industries "Kwik Bolt"

#### **PART 3 - EXECUTION**

##### **3.1 INSTALLATION**

- A. Provide common support trapezes for parallel raceways.
- B. Use manufactured preformed U-Channel system having accessory connecting and clamping devices available where parallel raceways are to be supported. Load channel system not to exceed manufacturer's recommendation.
- C. Fabricate supports for transformers, panel boards, cable tray, lighting fixtures, cabinets, pull and junction loads, and similar electrical products from preformed U-Channel systems. Load channel system not to exceed manufacturer's recommendations.
- D. Use preformed U-Channel concrete inserts preset into forms to secure hangers suspended from slabs.
- E. Use concrete expansion shield anchors or preformed U-Channel cast-in-place concrete inserts for attaching electrical products to concrete walls.

- F. Support loads from stud anchors or concrete inserts at not to exceed manufacturer's live loading recommendations.
- G. Do not use powder-charge driven fasteners.
- H. Do not drill holes or install driven fasteners in concrete at less than 12 inches from prestressed steel.
- I. Do not use nylon or similar concrete inserts without prior approval, except for supporting 1 inch or smaller individual runs of conduit or tubing.
- J. Use toggle bolts to attach supports for electrical products to hollow masonry walls. Do not attach products weighing more than 50 pounds to hollow masonry walls, without prior approval.
- K. Use toggle bolts in hollow tile.

END OF SECTION

## **SECTION 262416**

### **PANELBOARDS**

#### **PART 1 - GENERAL**

##### **1.1 DESCRIPTION**

- A. Provide electric service with capacity as shown on the drawings.
- B. Power Company Coordination: coordinate service arrangements and pay associated fees necessary to provide a complete operating system. Provide meter socket and/or CT cabinet of size and type dictated by the power company.
- C. Interrupting Capacities: Panel boards to have interrupting capacity capable of handling fault current which is available at the point in the circuit where the panel is installed.
- D. Interrupting ratings are listed in the Schedule of Panels on the drawings or in Appendix A of these specifications. These capacities are based on feeder sizes and panel locations shown on drawings. If major changes are made, these ratings must be adjusted.

#### **PART 2 - PRODUCTS**

##### **2.1 120/208 PANEL BOARDS**

- A. 120/208 volt panel boards shall be of the dead front type and have branch circuit protectors in the quantity and of ratings indicated on the drawings and panel schedules. Panel boards shall be designed for use on a 3 phase, 4 wire, 120/208 volt system. Panel boards shall be provided with ground bar bonded to the steel cabinet, separate neutral bar, and main lugs or breaker as noted.
- B. 120/208 panel boards, unless otherwise noted, shall be Square D Type NQOD 120/208 volts, 3 phase, 4 wire, s/n with main breaker or main lugs only as noted with single pole, individual trip and 2 and/or 3 pole common trip bolt-on type branch circuit breakers and as per drawings and panel schedules. Certain panels may be double with feed through lugs as indicated.
- C. Bus bars and current carrying parts of panel boards exclusive of circuit breaker, shall be hard drawn copper sized in accordance with the requirements of the Underwriters' Laboratories, Inc.
- D. The branch circuit portions of each panel board shall comprise the required and indicated number of interchangeable bolt-on non-combustible thermal-magnetic circuit breaker sections; single or multiple pole, rated not less than 20 amperes, 125 volts and higher as noted. Breakers as required to provide I.C. sym. amp as shown on the panel schedule(s).
- E. Circuit breakers shall be readily removable from the front of panel board without disturbing adjacent units. They shall have quick-make and quick-break toggle mechanisms, non-fusible contacts, with inverse time, short circuit characteristics. Breakers shall trip free on overload. They shall indicate clearly whether they are in the open, tripped or closed position. Multipolar units shall have thermal element in each pole and shall have a single handle. Closely grouped circuit breakers and thermal tripping devices mounted in a common cabinet shall be de-rated when necessary in

accordance with NEMA standard recommended practices for high ambient temperatures.

- F. Panel boards with breakers larger than 100 amp., shall be Square D Type I-Line panel with breakers of the rating and frame size as noted on plan.
- G. Circuit breakers protecting circuits supplying receptacles, signaling devices, clocks, special equipment and other similar circuits not requiring switch control shall be equipped with an approved locking device.

## 2.2 PANEL BOARD CABINETS

- A. Panel boards shall be mounted in a sheet steel enclosing cabinet designed for surface or flush mounting as indicated on the drawings. Cabinets shall be fabricated of code gauge, galvanized sheet steel. The rear of the cabinets shall be provided with a suitable means of supporting the panel board in such a manner that adjustments may be made in all directions.
- B. Cabinets shall have suitable lugs for mounting and be provided with hinged steel trims and doors. Doors and trim shall be hung with heavy flush butt hinges. Doors and trims shall be of integral door-in-door construction or piano hinge trim and so designed that doors shall close without a rabbet. Doors 48 inches high or less shall be equipped with spring locks and catches. Doors larger than 48 inches in height shall be provided with a vault type handle having 3-point shoot bolts. Doors shall be finished with factory coat of baked enamel.
- C. In general, cabinets shall be installed so that the operating handle of the top branch circuit protector shall not exceed 78 inches above finished floor and the bottom of the cabinet be not less than 12 inches above finished floor.
- D. Fronts of cabinets shall have adjustable indicating type clamps and angle iron rests near the bottom to aid in installation and removal.
- E. Cabinets shall be provided with proper number and size openings for conduits installed. No openings shall be permitted which are not to be activated.
- F. In instances where it is necessary to group install cabinets, a common trim shall be employed.
- G. Circuit directory holders shall be attached to the inside of each cabinet door and have transparent cover under which shall be placed a neatly typed schedule outlining circuit control. Schedule shall use Owner-designated room numbers, not drawing room numbers.
- H. Extend two (2) spare empty 1 inch conduits from each recessed panel in finished areas to space above ceiling for future use.

## 2.3 LOCKS AND KEYS

- A. Locks for lighting, power, and miscellaneous panel boards, telephone cabinets and other electrical systems having locked apparatus shall be similarly keyed to institutional keying system. Panel door to have keyed metal latch and lock. Plastic locks are not acceptable.

## 2.4 SHUNT TRIP BREAKERS

- A. Panels in certain areas where shown on plan shall be equipped with main breakers with shunt trip devices with 120 volt coils. Connect emergency stop buttons in parallel to the shunt trip devices so that pushing any of the stop buttons in a given area shall

de-energize the power feeding the panel mains. Power restoration shall be made at the panel by resetting the main breaker. Extend an independent local source of 120 volt power to each shunt trip coil. Switch shall be an integral part of the panel and shall be ASCO #920 mechanically held switch or approved equal. Size as indicated on panel schedule(s).

- B. The emergency stop buttons shall be momentary contact, NEMA I, heavy duty, red, mushroom head, 1 N.O. pushbutton. Provide pilot light in pushbutton box to indicate when panel is energized.

## 2.5 CIRCUITING

- A. Each and every outlet, device, box and system requiring power shall be circuited to the respective panels as shown on plan. Refer to plan and schedules for sizes of wire, conduit and breakers. In instances where a specific circuit has not been assigned to a box requiring same, a circuit shall be provided for the load served as directed by the Architect at no additional cost to the Owner.

## 2.6 MAIN SWITCHBOARD

- A. Provide where indicated, a dead front type, completely metal enclosed, self-supporting structure independent of wall supports. It shall consist of the required number of vertical sections bolted together to form one rigid switchboard 90-3/8 inches high incorporating switching and protective devices of the number, ratings and type noted herein or shown on the drawings with necessary interconnections. Switchboard construction shall be of the universal frame type using die-formed members bolted and braced through the exclusive use of self-tapping bolts which shall not loosen during shipment. Ventilation openings shall be provided where required. Covers shall be secured by self-tapping screws. Properly anchor to floor.
- B. The bus shall be tin plated copper of sufficient size to limit the temperature rise to 55°C based on UL tests, and adequately braced and supported to withstand mechanical forces exerted during short circuit conditions when directly connected to a power source having the indicated available short circuit current. Connections shall be tightly bolted.
- C. A ground bus and lug shall be furnished firmly secured to each vertical section structure and shall extend the entire length of the switchboard.
- D. Switchboard shall be provided with adequate lifting means and shall be capable of being rolled or moved into installation position and bolted directly to the floor without the use of floor sills.
- E. A-B-C type bus arrangement, left-to-right, top-to-bottom, and front-to-rear, as viewed from the front, shall be used throughout.
- F. Record drawings shall be furnished providing the following information: switchboard voltage/current rating; overall outline dimensions including available conduit space; switching and protective device ampere ratings; and one line diagram.
- G. Adequate conduit space shall be provided to meet NEC requirements.
- H. Each switching and protective device shall be provided with visible means of ON-OFF identification. Terminals shall be of the anti-turn solderless type suitable for copper cable of sizes indicated.

- I. Exterior and interior steel surfaces of the switchboard shall be properly cleaned and finished with two-toned gray baked enamel over a rust-inhibiting phosphatized coating. Two-toned gray shall be ANSI 61 and ANSI 49.
- J. Switchboard shall be of construction Square D Type QED, 3 phase, 4 wire, voltage as specified on drawings, in which:
  - 1. Sections of the switchboard shall be 30 inches deep except service sections containing large ampacity main circuit breakers.
  - 2. Construction shall allow maintenance of incoming line terminations, main device connections and main bus bolted connections to be performed without rear access.
  - 3. The feeder or branch devices shall be removable from the front and shall be panel mounted with the necessary device line and load connections front accessible.
  - 4. The main horizontal bus bars shall be mounted on glass polyester insulators with all three phases arranged in the same vertical plane. The main bus shall have a maximum ampacity and shall be braced for short circuits as indicated on the drawings. Main bus splices shall be supplied between adjacent distribution sections.
  - 5. Vertical sections shall be completely factory assembled, wired and tested before delivery and shall bear UL labels where qualified. Design shall meet NEC and NEMA standards as well as OSHA requirements. Individual vertical sections shall be designed for bolting together at installation site.
  - 6. All interconnecting wires for connecting of vertical sections shall be field installed.
- K. Provide switchboard with solid state, digital metering with KW, KWH, voltage, amperage, power factor, and THD capability.
- L. Provide switchboard with integral service entrance (Category C) transient voltage surge suppressor (TVSS). See Section 16650.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Install new service feeders, panel boards and switch boards as required to provide a complete operating system.
- B. Unless otherwise stated, install equipment in accordance with manufacturer's recommendations.
- C. Completely vacuum and clean all panels before energizing and before covers are permanently installed.

END OF SECTION

## SECTION 262726

### WIRING DEVICES

#### PART 1 - GENERAL

##### 1.1 DESCRIPTION

- A. This section covers power-related devices such as receptacles, switches, and plug strips.
- B. Devices listed in this section may or may not be used on this project. Specifications for devices not included in the Contract Documents are included in case they are needed during construction phase.

##### 1.2 LOCATION OF DEVICES

- A. The approximate schematic location of devices is given on the drawings. The exact location shall be determined at the building as the work progresses. Refer to Architectural plans for any special details, elevations, and reflective ceiling plan. Verify door swings at job site. In no case shall switches be located behind door swings. Any switch so located shall be changed. Field verify equipment locations and adjust device and outlet locations to avoid inaccessibility. Relocate inaccessible outlets.
- B. Unless otherwise indicated, or otherwise decided at the site, outlet boxes in walls shall be located with centerline at elevation above the finished floor as shown on table.

Fire Alarm Strobe Light.....	6 feet 8 inches
Fire Alarm Pull Stations .....	3 feet 6 inches (to activation handle)
.....	3 feet 8 inches (to top of device)
Fire Alarm Horn .....	8 feet or 6 inches below ceiling in
	low-ceiling (wall mounted) areas
Wall Switch Outlets.....	4 feet
Convenience Outlets .....	1 foot 6 inches
Counter Outlets.....	8 inches above countertop

- C. The Architect and the Owner reserve the right to change the location of any outlet, before it has been installed.

##### 1.3 DESCRIPTION

- A. Wiring Device Requirements
  - 1. Use the products of a single manufacturer for each type of wiring device.
  - 2. Use the products of a single manufacturer of all device plates. Obtain prior approval for any variations from this requirement, except that plate variations are allowed for the following devices:
    - a. Where the selected plate manufacturer does not manufacture a suitable finish plate.
    - b. For clock receptacles.
    - c. For heavy-duty receptacles rated at more than 30 amperes.
    - d. Where the raceway system enclosure employs a non-standard finish plate.



- e. Where non-standard plates are specified or indicated.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. Representative general purpose wiring devices and device plates as listed herein are intended to indicate type, function, and quality of the products. Provide the products specified.

### 2.2 SWITCHES

- A. General

1. Switches mounted vertically shall have the "ON" position at the top and horizontal-mounted switches shall have the "ON" position at the left.
2. Tumbler switches shall be the AC heavy-duty, specification grade, 120/277 volts, flush toggle type switch rated at 20 amperes, Underwriters' approved and meeting NEMA Standard WD-1 1965 and Federal Specifications W-S-896d (Type III). The operating mechanism shall be totally enclosed in a high-heat, non-inflammable, non-hygroscopic molded compound case with terminal screws located on the side of the switch. Operating handles shall be made of high heat phenolic compound. Switches shall have wide plaster ears.

- B. Manufacturers

1. Single pole toggle switch, 20 ampere, 120/277 volt, specification grade, Hubbell Catalog No. 1221-I, Pass & Seymour Catalog No. 20AC1-W, or Bryant Catalog No. 4621-I.
2. Three-way toggle switch, 20 ampere, 120/277 volt, specification grade, Hubbell Catalog No. 1223-I, Pass & Seymour Catalog No. 20AC3-W, or equal of Bryant.
3. Four-way toggle switch, 20 ampere, 120/277 volt, specification grade, Hubbell Catalog No. 1224-I, Pass & Seymour Catalog No. 20AC4-W, or equal of Bryant.
4. Double pole toggle switch, 20 ampere, 120/277 volt, specification grade, Hubbell Catalog No. 1222-I, Pass & Seymour Catalog No. 20AC2-W, or equal of Bryant.
5. Single pole key lock switch, 20 ampere, 120/277 volt, specification grade, Hubbell Catalog No. 1221-L, Pass & Seymour Catalog No. 20AC1-L, or equal of Bryant.

- C. Miscellaneous Switch Appurtenances

1. Weatherproof cover - Hubbell 1795
2. Locking cover - Hubbell 96061

### 2.3 CONVENIENCE RECEPTACLES

- A. Receptacles shall be specification grade receptacles in all locations.
- B. Receptacles for convenience outlets shall be duplex self-aligning grounding type rated for 20 amperes at 125 volts. Contacts shall be made of heavy spring copper or bronze so designed as to securely grip both sides of each receptacle blade and shall be enclosed in high heat, non-inflammable, non-hygroscopic molded compound case, provided with wide plaster ears. Each terminal shall be provided with two (2) binding screws located on the side of the receptacle.

C. Manufacturer(s)

1. Duplex receptacle, 20 ampere, 125 volts, 2 pole, 3 wire grounding type, NEMA 5-20R; Hubbell Catalog No. 5362-I, Pass & Seymour Catalog No. 5362-AW, or Bryant Catalog No. 5362-I.
2. Emergency duplex receptacle, 20 ampere, 125 volt, 2 pole, 3 wire grounding type, NEMA 5-20R, and connected to the normal/emergency system; Hubbell Catalog No. 5362-R, Pass & Seymour Catalog No. 5362-ARED with smooth finish red cover plate. The cover plate shall have the word "emergency" engraved at the top with white filled lettering.
3. Ground fault interrupter type duplex receptacle, 20 ampere, 125 volt, 2 pole, 3 wire grounding type, NEMA 5-20R; Hubbell Catalog No. GF-5362-I, Pass & Seymour Catalog No. 2091 W.
4. Single receptacle, 20 ampere, 125 volt, 2 pole, 3 wire grounding type, NEMA 5-20R ("EWC" denotes electric water cooler--coordinate mounting height with the equipment supplier.); Hubbell Catalog No. 5361-I, Pass & Seymour Catalog No. 5361-I.

D. Appurtenances

1. Weatherproof covers - use Hubbell WP26 or WPSF26, Pass & Seymour Catalog No. WPH8 or Bryant Catalog No. 4510D for GFI-WP locations; or Hubbell 5205WO or 5206WO, Pass & Seymour Catalog No. WPH26 for non-GFI-WP locations.

2.4 COVER PLATES

- A. Unless otherwise specified, switch, receptacles, special purpose outlets, telephone, and other outlet plates shall be Bureau of Standards No. 302-18.8 brushed or satin stainless steel with beveled edges so as to lie flat against the wall. Where more than one (1) switch occurs at one point, gang plates shall be used.
- B. Zinc-coated plates may be used in unfinished spaces.
- C. Plates shall be set true and plumb and shall fit tight against finished wall surfaces and outlet boxes.
- D. Manufacturers: Hubbell 97000 Series, Pass & Seymour SL1 Series, or Bryan 5600 Series.
- E. Narrow jamb switch to have Leviton 1794 plate.

2.5 WALL SWITCH SENSORS

A. General

1. Wall switch sensors shall be installed as shown on the drawings to control light fixtures in toilet rooms, corridors, mechanical rooms, electrical rooms, etc., that are less than 1200 square feet in size.

B. Manufacturers

1. Wall switch sensors shall have a field adjustable time delay from one (1) to twenty (20) minutes, cover a maximum of 1200 square feet, have a 180 degree field of view, have a three (3) position override switch (off-auto-on) and have a LED system test.

2. Wall switch sensors, 20 ampere, 120/277 volt 1500 watt, shall be Bryant Catalog No. MSFL1200I.

## 2.6 CEILING MOUNT SENSORS AND LOW VOLTAGE CONTROL PACKS

### A. General

1. Ceiling mount sensors and low voltage control packs shall be installed as shown on the drawings to control light fixtures in corridors, mechanical rooms, electrical rooms, stairways, etc., that are larger than 1200 square feet in size.

### B. Manufacturers

1. Ceiling mount sensors shall cover 600 square feet of area and shall be Bryant Catalog No. MSCM-600.
2. Low voltage control panels shall be rated at 20 ampere, 120/277 volt and shall be Bryant Catalog No. CP120-277.

## 2.7 OCCUPANCY SENSORS

### A. Provide occupancy sensor devices in accordance with Contract Documents.

### B. Wall Mounted Switch / Occupancy Sensor

1. Switch shall fit in standard wallbox and be gangable with other units. Unit shall have manual on/off pushbutton light switching which shall operate at any time.
2. Passive infrared occupancy sensor devices shall have a 180° field of view with a maximum coverage of 2100 square feet. The maximum sensing distance in front of the sensor is 40 feet and at each side is 30 feet.
3. Sensor shall have self-adjusting delayed-off time interval for real-time occupancy patterns.

### C. Ceiling Mounted Occupancy Sensor

1. Sensor shall be all-digital with passive infrared technology designed for ceiling mounting.
2. Sensor shall have 360° pattern sensing with coverage area of 530 square feet.
3. Sensor shall have self-adjusting delayed-off time interval for real-time occupancy patterns. Manual time adjustment shall be 20 seconds -15 minutes with ambient override ON.
4. Input voltage shall be 120 volts AC and shall have a load rating of 1000 watts.

### D. Manufacturers:

1. Wall Mounted: Leviton #ODS15-ID or equivalent.
2. Ceiling mounted: Leviton #ODC0S-I1W or equivalent

## 2.8 GFI PROTECTED RECEPTACLES

### A. Receptacles shall be GFI protected via GFI receptacle or GFI breaker in the following locations:

1. Where shown on the drawings.
2. In toilet and bathrooms.
3. Exterior receptacles within 15 feet of ground level or on roof.

- B. Receptacles installed above any counter within 6 feet of sink.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Devices shall be flush mounted unless otherwise noted. Properly align and plumb devices and plates. Plates shall fit flat against wall and tight against device surface without strain on plate.
- B. Code sized (#12 minimum) bonding jumper shall connect grounded outlet box to receptacle grounding terminal on flush-mounted units.
- C. Where receptacles are indicated as split-wired and half of the receptacle is on a wall switch, the top receptacle shall be switched and bottom shall be on normal power.
- D. Circuits to wiring devices feeding data processing equipment shall have a dedicated neutral for each 120 volt circuit. No common neutrals for data processing equipment shall be permitted.
- E. Mount occupancy sensors according to manufacturer's recommendations.
- F. Switches mounted vertically shall have the "ON" position at the top and all horizontal-mounted switches shall have the "ON" position at the left.
- G. Where receptacles are mounted in the vertical position, the ground terminal shall be on the top, and where receptacles are mounted in the horizontal position, the ground terminal shall be on the left.

END OF SECTION

## **SECTION 262813**

### **FUSES**

#### **PART 1 - GENERAL**

##### **1.1 DESCRIPTION**

- A. Provide fuses in accordance with the contract documents in motor starters, switchgear assemblies, panel boards and disconnect switches.
- B. Fuses in equipment shall be furnished by the respective contractor supplying the device and installed under this Division.
- C. Provide a complete set of three (3) spare fuses for each fuse size and type used.
- D. All fuses provided shall be of the indicating type, employing either an indicating window or a mechanical indicator striker pin.

#### **PART 2 - PRODUCTS**

##### **2.1 MANUFACTURER**

- A. Fuses shall be of the high interrupting rating, current limiting type and manufactured by the Bussman Company, Chase Shawmut, or Littelfuse.

#### **PART 3 - EXECUTION**

##### **3.1 INSTALLATION**

- A. Ensure that fuses are firmly and completely inserted into fuse holders and that mechanical joints are tightened.

**END OF SECTION**

## SECTION 262816

### MOTOR AND CIRCUIT DISCONNECTS

#### PART 1 - GENERAL

##### 1.1 DESCRIPTION

- A. Provide motor and circuit disconnect switches in accordance with the Contract Documents.
- B. Switches shall be of proper horsepower rating as applicable for the load served and have dual interlocks designed to interlock the switch box door with the switch operating mechanism. Unit shall be provided for locking the operating handle in the "ON" or "OFF" position.

#### PART 2 - PRODUCTS

##### 2.1 MATERIALS

- A. Disconnect switches shall comply with the following requirements, unless otherwise indicated or specified:
  - 1. Enclosure: NEMA 1, surface type in dry locations. Use NEMA-3R for exterior locations and wet locations where walls are washed.
  - 2. Ratings: Voltage, ampacity, horsepower and inductive ratings complying with power source voltage and characteristics of load controlled.
  - 3. Mechanism: Heavy duty, quick-make, quick-break, with voidable interlock to prevent opening enclosure in "ON" position. External lockable handle operation with provision for not less than two padlocks.
  - 4. Poles and Fusing: Comply with load requirements. Provide unfused switches except where fusing is indicated or required to comply with Code requirements. Where fuses are installed, use dual-element fuses.
  - 5. Poles and Overcurrent Protection: Comply with load requirements. Provide unfused switches except where overcurrent protection is indicated or required to comply with Code requirements. When required, install breaker type disconnects. Breaker shall be designed and rated for motor load protection specifically.
  - 6. NEMA Standard: Comply with KSI-1969, Part Four.
  - 7. Switches in hazardous areas shall be in enclosure bearing UL label for installation in class and division of hazard.
  - 8. Finishes: Light gray ANSI-61.
- B. Provide power disconnect switches of the following manufacturers with characteristics complying with load and power source indicated:
  - 1. Square D: Type HU.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Provide the number of poles necessary to include a pole for each ungrounded conductor. Equip switch with neutral terminal point where neutral is present. Do not switch neutral.
- B. In finished areas, disconnect switches shall be flush mounted. Use circuit breaker type if switch type is not available for flush mounting.
- C. In areas remote from the distribution panel board necessary to meet code provide non-fused disconnect switches for motors and equipment not already shown to be furnished by others.

END OF SECTION

## **SECTION 265100**

### **LIGHTING**

#### **PART 1 - GENERAL**

##### **1.1 DESCRIPTION**

- A. Provide a complete complement of luminaires and required appurtenances including lamps, mounting hardware, and accessory wiring.
- B. Fixture manufacturer and numbers as specified on the Fixture Schedule, have been taken from the catalogs of fixture manufacturers. Fixture numbers and descriptions are intended to denote a standard of quality and type. Fixtures of other manufacturers that meet or exceed the photometric data of specified fixtures may be used provided a complete comparable schedule is submitted to and approved by the Architect in accordance with the Instructions to Bidders and Supplementary Conditions. Fixture types shown on the Schedule are keyed to the fixture type letters shown on the drawings adjacent to the light fixture.
- C. Fixture manufacturers and catalog numbers on the fixture schedule have been selected with respect to their photometric output, design construction, and applicability. Approved equal manufacturers' fixtures must meet or exceed the above referenced standards as determined by the Architect/Engineer. Any deviation from these or other pertinent standards shall result in rejection of the lighting fixture package.

#### **PART 2 - PRODUCTS**

##### **2.1 LIGHTING FIXTURES**

- A. All fixtures are to be new LED type with high efficiency drivers as schedule on plans.
- B. All fixtures located within any single room shall be provided with the same lamp color. Mixed lamp colors will not be acceptable.
- C. Acrylic diffusers shall be 100% virgin acrylic .125 inch thick minimum. Furnish certificate from the lighting fixture manufacturer certifying same.
- D. Fixtures shall be furnished complete with suitable pendants, canopies, cover, ceiling roundels, opening flanges, hangers, plaster rings or frames if recessed, and necessary rubber cords, chains.
- E. Integral outlet boxes factory mounted on recessed fixtures are preferred, but not specifically required.
- F. Finish: metal parts of fixtures shall be painted. Interior reflective surfaces shall be of baked on white enamel unless fixture specified is normally furnished with another finish type.

#### **PART 3 - EXECUTION**

##### **3.1 GENERAL**

- A. Every lighting outlet shall have a lighting fixture unless otherwise directed. In instances where a specific type of fixture has not been assigned to an outlet, provide a complete



fixture of the type and wattage designated for outlets of similar function and/or type as directed by the Architect at no additional cost to the Owner.

- B. At completion of work, lighting equipment shall be dusted and washed and left in condition ready to use.

### 3.2 FIXTURES

- A. Verify with the room finish schedule as to the type of surface construction. Order the proper fixture with hardware for installation in or on the specified surface. Recessed fixtures in plaster ceilings shall include a plaster frame and a matte white trim finish.
- B. Properly size the openings for recessed fixtures and provide all-wood or metal frames properly set in place and anchored.
- C. Fixtures shall be installed at mounting heights as shown on the drawings or indicated in the specifications. Coordinate mounting heights of wall-mounted fixtures with the Architect.
- D. Unless otherwise directed, pendant fixtures within the same room or area shall be installed plumb and at a uniform height from the finished floor. Adjustment of height shall be made during installation. Make arrangements to meet mounting heights.
- E. Fixtures mounted on outlet boxes shall be rigidly secured to a fixture stud in the outlet box. Hickies or extension pieces shall be installed where required to facilitate proper installation. Surface mounted incandescent fixtures shall have the base slotted where required to receive the "T" bar tile and fit snug against ceiling.
- F. Flush mounted recessed fixtures shall be installed so as to completely eliminate light leakage between the frame and the finished surface. Fixture housing, frame or canopy shall provide a suitable cover for the fixture outlet box. Where sloping ceilings occur, recessed fixtures shall be of a type designed for the application and shall be mounted to provide proper lighting.
- G. Fixtures and/or fixture outlet boxes shall be provided with hangers to adequately support the complete weight of the fixture. Design of hangers and method of fastening other than shown on the drawing or specified shall be submitted to the Architect for approval.
- H. Suspended ceiling construction alone shall not satisfactorily support luminare, provide and install appropriate and adequate auxiliary steel supports. Supporting methods shall be as directed by the Architect/Engineer. Auxiliary supports shall be rigidly attached to substantial building construction. Additional wires shall be provided so that supports shall not deflect more than 1/360 of the span with twice the fixture weight. Provide "scissor clips" on the "T" bar construction for installation of surface mounted fluorescent fixtures.
- I. Furnish necessary additional auxiliary supporting steel for fixtures not mounted on building framework, and where necessary to span the ceiling channels of hung ceiling construction.
- J. In areas where other means are inadequate, fixtures shall be installed on "Kindorf" System as manufactured by Steel City Company, or equivalent of B-Line. This system shall be suspended from the structural steel members and shall have vibration resistant assembly connections. Rods used for suspension shall be galvanized and surface raceway suspension shall have corrosion resistant paint.
- K. In mounting troffers mount fixtures with lamps oriented in the same direction.

- L. Primary supports for all light fixtures shall be from building structure (separate from ceiling system).
- M. Use Type MC cable in length not to exceed 6 feet from building wiring junction box to each light fixture.
- N. Direct wiring between light fixtures shall not be permitted.

END OF SECTION