

**SPECIFICATIONS  
AND  
FORMS OF CONTRACT, BONDS AND BID PROPOSALS**

**FOR**

**HIDALGO COUNTY - URBAN COUNTY PROGRAM  
CITY OF HIDALGO  
2016 PARKS, RECREATIONAL FACILITY IMPROVEMENTS  
(VALLE ALTO PARK)**

**IN  
HIDALGO, TEXAS**

**BID NO. 5016/17-35-0306-5000-3500-UCP-GVG**

**Prepared By:**

**JAVIER HINOJOSA ENGINEERING  
416 E. DOVE AVENUE  
McALLEN, TEXAS 78504  
(956) 668-1588  
FAX: (956) 994-8102  
e-mail: javhin@rgv.rr.com  
TBPE FIRM NO. F-1295**

# General Request for Bid Package

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# INVITATION TO BIDDERS

The County of Hidalgo would like to invite you to submit a bid on the following:

Bid No.:	Bid Description:	Opening Date:
5016/17-35-0306-5000-3500-UCP-GVG	City of Hidalgo – 2016 Parks, Rec. Fac. Imp. (Valle Alto Park)	Wednesday, October 10, 2018 at 9:30 a.m.

**Specifications:** Specifications including drawings and technical specifications may be viewed and/or obtained at [Javier Hinojosa Engineering., located at 416 E. Dove Avenue, McAllen, TX 78504 Phone: \(956\) 668-1588](#). Copies of the above documents may be obtained at the office of the engineer in accordance with the Instruction to Bidders upon the non-refundable deposit of **\$150.00** for each set of documents.

**Pre-Bid Conference:** A Pre-Bid Conference will be held on [Tuesday, October 2, 2018 at 10:00 a.m.](#) at the Urban County Program office located at 427 E. Duranta Ave., Suite 107, Alamo, TX 78516.

**Requirements:** Upon submitting sealed bid, bidders are required to properly identify (handwritten, typed, or printed) sealed envelope and/or packet as follows: Bidder's name and address on the upper left hand corner of the sealed envelope and/or package and [Bid No. 5016/17-35-0306-5000-3500-UCP-GVG "City of Hidalgo –2016 Parks, Rec. Fac. Imp. \(Valle Alto Park\)"](#) on the lower left hand corner of sealed envelope/and or packet. Overnight mail must also be properly labeled on the outside of express envelope or package.

The sealed bid must contain one (1) original and two (2) copies of bid and must be clearly identified and addressed for delivery to:  
**Martha L. Salazar, CPPB, Hidalgo County Purchasing Agent**  
**Hidalgo County Purchasing Department**

**US Postal Mail/Courier Address:**  
2812 S. Business Hwy. 281  
Hidalgo County New Administration Building  
Edinburg, Texas 78539

**Physical Location:**  
2802 S. Business Hwy. 281  
Hidalgo County New Administration Building  
(Southeast of Canton Rd & Business 281)  
Edinburg, Texas 78539

**Deadline:** Sealed bids will be accepted until [Wednesday, October 10, 2018 at 9:30 a.m.](#) at which time they will be opened in the Hidalgo C-ounty Purchasing Department Conference Room at Physical Location: 2802 S. Business Hwy 281, Hidalgo County New Administration Building in Edinburg, Texas 78539. No facsimiles or late arrivals will be accepted. Any bid received after that time will not be opened and will be returned.

**Bid Security:** Bid Security in the amount of 5% of the largest possible total of bids submitted must accompany each bid in accordance with the Instruction to Bidders. The surety must be a guaranteed or surety company acceptable to the Hidalgo County and listed in U. S. Treasury Circular No. 570.

**Davis-Bacon Prevailing Wage Rates:** This project is funded by the U.S. Department of Housing & Urban Development Community Development Block Grant Program and bidders must adhere to Texas State Prevailing Wage Requirements for Hidalgo County and Davis-Bacon Federal Wage Rates, including Certified Payroll. Be advised applicable wage rates may change.

**Section 3/WMBE:** The County of Hidalgo will actively encourage participation of Section 3 businesses and Women and Minority Business Enterprises (WMBEs) on this project. All Section 3 business contractors, potential Section 3 business contractors, and WMBE contractors are strongly encouraged to submit bids. Please contact Hidalgo County-Urban County Program at 956-787-8127 for inquiries concerning Section 3 or specifics on how to become a Section 3 business. HUD Regulations 24 CFR 135.9, Requirements applicable to HUD NOFAs for section 3 covered programs states the following: (a) *Certification of compliance with part 135.* All notices of funding availability (NOFAs) issued by HUD that announce the availability of funding covered by section 3 shall include a provision in the NOFA that notifies applicants that section 3 and the regulations in part 135 are applicable to funding awards made under the NOFA. Additionally the NOFA shall require as an application submission requirement (which may be specified in the NOFA or application kit) a certification by the applicant that the applicant will comply with the regulations in part 135. (For PHAs, this requirement will be met where a PHA Resolution in Support of the Application is submitted.) With respect to application evaluation, HUD will accept an applicant's certification unless there is evidence substantially challenging the certification. (b) *Statement of purpose in NOFAs.* (1) For competitively awarded assistance in which the grants are for activities administered by an HA, and those activities are anticipated to generate significant training, employment or contracting opportunities, the NOFA must include a statement that one of the purposes of the assistance is to give to the greatest extent feasible, and consistent with existing Federal, State and local laws and regulations, job training, employment, contracting and other economic opportunities to section 3 residents and section 3 business concerns.

The County reserves the right to refuse and reject any/all bids and to waive any/all formalities or technicalities, or to accept the bid considered the best and most advantageous to the County. By order of the Commissioners' Court of the County of Hidalgo, Texas on this the [9<sup>th</sup> day of June, 2016](#).

**MARTHA L. SALAZAR, CPPB**  
**HIDALGO COUNTY PURCHASING AGENT**  
**REPORT ROAD HAZARDS @ 1-866-HCR-SAFE OR 1-866-427-7233**



September 13, 2018

To Whom It May Concern:

Re: HIDALGO COUNTY- URBAN COUNTY PROGRAM  
Request for Bids: "CITY OF HIDALGO – 2016 PARKS, REC. FAC. IMP. (VALLE  
ALTO PARK)"  
Bid No: 5016/17-35-0306-5000-3500-UCP-GVG

Dear Gentleman/Ladies:

Enclosed please find a Request for Bid (RFB) packet for your review and consideration.

Hidalgo County Urban County Program welcomes and appreciates your participation in the bid process.

If any further assistance is required, please do not hesitate to call Guadalupe V. Garcia, Program Coordinator at (956)787-8127.

Sincerely,



Diana R. Serna, Director  
Urban County Program

Enclosures:

**RFB No: 5016/17-35-0306-5000-3500-UCP-GVG**

**Urban County Program Coordinator:  
Guadalupe Garcia**

**Tel. No: (956) 787-8127**

## **REQUEST FOR BIDS**

**U.S. Department of Housing & Urban Development  
Hidalgo County-Urban County Program  
“City of Hidalgo - 2016 Parks, Recreational Facility  
Improvements (Valley Alto Park)”**

## **BID OPENING DATE**

**Wednesday, October 10, 2018 at 9:30 am.**

**Contact Person:**

**Javier Hinojosa, P.E, Project Engineer  
Javier Hinojosa Engineering  
416 E. Dove Avenue  
McAllen, TX 78504  
956-668-1588**

1. Sealed bids will be received for **“Hidalgo County-Urban County Program City of Hidalgo - 2016 Parks, Recreational Facility Improvements (Valley Alto Park)”** in accordance with the specifications attached as Exhibit "A" hereto. Bids should address all specifications set forth.
2. One (1) original and two (2) copies of all bids are required with the bidders name and return address clearly typed/printed on upper left hand corner and the proper notation clearly typed/printed on the lower left hand corner of the envelope and/or package: **“RFB No: 5016/17-35-0306-5000-3500-UCP-GVG Hidalgo County-Urban County Program City of Hidalgo - 2016 Parks, Recreational Facility Improvements (Valley Alto Park)”** and in County's Purchasing Department, 2802 So. Bus. Hwy 281, Administration Building, Postal: 2812 So. Bus. Hwy 281, Edinburg, Texas 78539, on or before **9:30 a.m., October 10, 2018. NO FACSIMILES OR LATE ARRIVALS WILL BE ACCEPTED. ANY RFB RECEIVED AFTER THAT TIME WILL NOT BE OPENED AND WILL BE RETURNED. OVERNIGHT MAIL MUST ALSO BE PROPERLY LABELED ON THE OUTSIDE OF EXPRESS ENVELOPE OR PACKAGE WITH REFERENCE TO: “RFB No: 5016/17-35-0306-5000-3500-UCP-GVG Hidalgo County-Urban County Program City of Hidalgo - 2016 Parks, Recreational Facility Improvements (Valley Alto Park)”** Hidalgo County reserves the right to refuse and reject any/all RFB and to waive any/all formalities or technicalities, or to accept the RFB considered the best and most advantageous to Hidalgo County.
3. Hidalgo County reserves the right to: A. separate and accept, or eliminate any item(s) listed under this bid that it deems necessary to accommodate budgetary and/or operational requirements; B. reject any or all bids submitted and further reserves the right to design the evaluation criteria to be used in selecting the lowest and best bid for approval.
4. The Bidder shall not substitute items named in the bid without the express written consent of Hidalgo County. Failure of the delivered item (s) to perform as specified or failure to meet the stated delivery schedule shall release Hidalgo County from all obligations to the contracting party with regard to the item(s) in question
5. For work to be performed at a County owned or operated location, each bidder shall, in its sole discretion, visit the job site before preparing the bid and thoroughly familiarize himself/herself with existing conditions. Bidder should take field dimensions and note all circumstances which affect the dollar amount of the bid.
6. No bid may be withdrawn within thirty (30) days from the scheduled time to open bids.
7. Proposed prices are to remain firm for a minimum of ninety (90) days after bid opening.
8. Any interpretations, amendments, corrections or changes to this bid document must be in a written addendum and signed by the County Judge or his designee. Addenda will be mailed to all who are known to have received a copy of the Request for Bids. Bidders shall acknowledge receipt of all addenda as a part of their bid.

- 9. County reserves the right to accept or reject any or all bids.
- 10. County is exempt from Federal Excise Tax, State Tax and Local Tax. Do Not include tax in cost figure. If it is determined that tax was included in the cost figures it will not be included in the tabulation of any awards. Tax exemption certificates will be furnished upon request.
- 11. Funds for this procurement will be provided through Hidalgo County Urban County Program with U.S. Department of Housing and Urban Development funds.
- 12. Upon award and prior to execution of a contract, Sole Proprietorships are required to submit a copy of their social security cards to the Hidalgo County Auditor's Office in order to establish an account with the County. All awarded vendors must submit a completed W-9 and a copy of their Federal ID Number Certificate.
- 13. Billing and payment instructions:
  - Must utilize Urban County Program Request for Payment form
  - Invoices must include:
    - a) Name and address of successful bidder
    - b) Name and address of receiving department or official
    - c) Purchase Order Number (if any)
    - d) Notation – **“Hidalgo County-Urban County Program City of Hidalgo - 2016 Parks, Recreational Facility Improvements (Valley Alto Park)”**  
Descriptive information as to the items or services delivered
  - Discount payments will be considered when offered
  - Contact person for Billing and Payment questions:

**Hidalgo County-Urban County Program**  
**427 E. Duranta Avenue, Suite 107**  
**Alamo, TX 78516**  
**ATTN: Diana R. Serna, Director**  
**(956) 787-8127**

- 14. Schedule of Events:
 

<b>Bid Opening</b>	<b>October 10, 2018</b>
Estimated Award of Contract	
Estimated Commence Work or Deliver Products	

- 15. Bid or Performance Bond and Debarment Certification; Payment under Contract:
  - If the contract proposed is for the construction of public works or is for a contract for goods & services exceeding \$100,000, all bidders shall furnish a good and sufficient bid bond in the amount of five percent of the total contract price. A bid bond must be executed with a surety company authorized to do business in Texas. All bidders are also required to furnish a certification or acknowledgment stating that the contractor or vendor is free from suspension or debarment pursuant to federal regulation 45CFR Part 76.



- Together with the signing of a contract or issuance of a purchase order following the acceptance of a bid, and prior to commencement of the actual work, the bidder shall furnish a performance bond to the County for the full amount of the contract, if that contract exceeds \$50,000.
- If the contract is for \$50,000 or less, no money will be paid to the contractor until completion and acceptance of the work or the fulfillment of the purchase obligation to the County, and, if applicable, the receipt by County of satisfactory evidence that all subcontractors and material men have been paid.
- If a contract is for the construction, alteration or repair of public buildings or public works, the contractor *shall* provide a payment bond for a contract in excess of Twenty Five Thousand Dollars (\$25,000.00), as required by Tex. Govt. Code Ch. 2253.
- For requirements contracts, bond requirements are determined by applying the proposed unit price to the estimated quantities included in the specifications.

#### 16. Section 3

- If the contract proposed is for the construction of public works and is for a contract for goods & services exceeding \$100,000, bidders must apply for qualification as a Section 3 Business Concern by completing the required Section 3 documents and Exhibits “A” through “K” provided.
- The recipient shall direct their efforts to award section 3 covered contracts, to the greatest extent feasible. A section 3 business concern seeking a contractor or a subcontract shall submit evidence to the recipient, if requested, sufficient to demonstrate to the satisfaction of the party awarding the contract that the business concern is responsible and has the ability to perform successfully under the terms and conditions of the proposed contract. (The ability to perform successfully under the terms and conditions of the proposed contract is required of all contractors and subcontractors subject to the procurement standards of §24 CFR 85.36 (see 24 CFR (b)(8)).
  - a) §24 CFR 85.36 (24 CFR (b)(8) of Procurement Standards states that grantees and sub-grantees will make awards only to responsible contractors possessing the ability to perform successfully under the terms and conditions of a proposed procurement. Consideration will be given to such matters as contractor integrity, compliance with public policy, record of past performance, and financial and technical resources.
- This regulation requires consideration of, among other factors, the potential contractor’s record in complying with public policy requirements. Section 3 compliance is a matter properly considered as part of this determination. Priority consideration shall be given , where feasible, to:
  - a) Section 3 business concerns that provide economic opportunities for section 3 residents in the service area or neighborhood in which the section 3 covered project is located (category 1 businesses) and;
  - b) Applicants (as this term is defined in 42 U.S.C. 12899) selected to

- carry out HUD Youth build programs (category 2 businesses);
- c) Other section 3 business concerns.

Information concerning Section 3 stated above was adopted from Title 24: Housing & Urban Development, Part 135 – Economic Opportunities for Low-and Very Low-Income Persons, §135.36 Preference for section 3 business concerns in contracting opportunities.

17. Ethical Standards:

- It shall be a breach of ethics to offer, give or agree to give any elected official, department head or employee, or former elected official, department head or employee, of the County, or for any elected official, department head or employee or former elected official, department head or employee of the County, to solicit, demand, accept or agree to accept from another person, entity or organization, a gratuity or an offer of employment in connection with any decision, approval, disapproval, recommendation, preparation or any part of a program requirement or purchase request, influencing the content of any specification or procurement standard, rendering of advice, investigation, auditing, or in any other advisory capacity in any proceeding or application, request for ruling, determination, claim or controversy, or other particular matter pertaining to any program requirement or a contract or subcontract, or to any solicitation or proposal therefore pending before any department or agency of the County.
- It shall be a breach of ethics for any payment, gratuity or offer of employment to be made by or on behalf of a subcontractor under a contract to the prime contractor or higher tier subcontractor for any contract for the County, or any person associated therewith, as an inducement for the award of a subcontract or order.
- No public official shall have an interest in a contract awarded hereunder except in accordance with Tex. Loc. Govt. Code Chapter 171.

**NOTICE:**

**ALL COMMUNICATIONS BY A VENDOR TO THE COUNTY, ITS OFFICIALS, AND DEPARTMENT HEADS REGARDING THIS PROCUREMENT SHALL BE DONE THROUGH THE HIDALGO COUNTY PURCHASING DEPARTMENT.**

18. Disclosure of Conflict of Interest

Effective January 1, 2016, Chapter 176 of the Texas Local Government Code requires that any vendor, person, consultant or contractor considering doing business with Hidalgo County (“the County”) to disclose in the Conflict of Interest Questionnaire (the “CIQ”) attached as Exhibit D, the vendor, person, consultant or contractor’s affiliation or business relationship that might cause a conflict of interest with the County. By law, the CIQ must be filed with the Hidalgo County Clerk’s Office no later than the seventh business day after the date the person becomes aware of facts that require that statement to be filed. The

disclosure requirement applies to a person or business who contracts or seeks to contract with Hidalgo County for the sale or purchase of property, goods or service. Any purchase order or contract resulting from this process shall be considered null and void if the successful bidder fails to comply with Texas Local Government Code Chapter 176. Vendors, consultants, contractors and others who desire to conduct business with Hidalgo County are encouraged to refer to Texas Local Government Code Chapter 176 for the details of this law. An offense under Texas Local Government Code Chapter 176 is a Class C Misdemeanor. **Completed Form CIQ must be submitted to the Hidalgo County Clerk's Office located at 100 N. Closer, Edinburg, Texas 78539 - Hidalgo County Courthouse.**

**COMPLETION AND SUBMISSION OF FORM CIQ IS THE SOLE RESPONSIBILITY OF THE PROSPECTIVE RESPONDENT. QUESTIONS REGARDING COMPLIANCE SHOULD BE DIRECTED TO YOUR LEGAL COUNSEL.**

**21. CERTIFICATE OF INTERESTED PARTIES (FORM HB1295)**

As of January 1, 2016, to comply with Texas Government Code Section §2252.908, and the rules issued by the Texas Ethics Commission found in Title 1, Section 46.1, 46.3 and 46.5 of the Texas Administrative Code, we have updated and revised our RFB packet. In accordance with these requirements, business must submit a completed Certificate of Interested Parties Form 1295 to the County before the County may enter into a contract with the business entity. In box 3 of Form 1295, you will provide the RFB No. as shown on the packet. Once completed and filed with the Texas Ethics Commission, Form 1295 must be printed and signed in the presence of a notary and submitted to our office either by facsimile transmission to (956) 318-2988 or via email to [guadalupe.garcia@co.hidalgo.tx.us](mailto:guadalupe.garcia@co.hidalgo.tx.us). Hidalgo County cannot enter into a contract until Form 1295 is submitted. Therefore, failure to timely submit Form 1295 signed and notarized may result in delay of award. Full instructions for completion and submittal of Form 1295 may be found on the Texas Ethics Commission website:

<https://www.ethics.state.tx.us/tec/1295-Info.htm>

**THE AWARDED VENDOR WILL HAVE THIRTY (30) DAYS TO SUBMIT THE SIGNED NOTARIZED FORM 1295. HIDALGO COUNTY CANNOT ENTER INTO A CONTRACT UNTIL FORM 1295 IS SUBMITTED.**

**FORM CIS (LOCAL GOVERNMENT OFFICER CONFLICTS DISCLOSURE STATEMENT will be included in packet as Exhibit "D-2". COMPLETION AND SUBMISSION OF FORM CIS IS THE SOLE RESPONSIBILITY OF THE PROSPECTIVE RESPONDENT. QUESTIONS REGARDING COMPLIANCE SHOULD BE DIRECTED TO YOUR LEGAL COUNSEL.**

19. If, during the life of any contract or bid awarded, the successful bidder's net prices generally available to other customers for items awarded herein are reduced below the contracted price, it is understood and agreed that the benefits of such reduction shall be extended to County.
20. Bids, and all goods and services provided there under, shall comply with all federal, state and local laws concerning this type(s) of goods and/or services.
21. Minimum Standards for Responsible Prospective Bidders: A prospective bidder must affirmatively demonstrate bidder's responsibility. A prospective bidder, by submitting a

bid, represents to County that it meets the following requirements:

- Possess or is able to obtain adequate financial resources as required to perform under the bid;
  - Be able to comply with Section 3 requirements by completion and submission of Section 3 required documents;
  - Be able to comply with the required or proposed delivery schedule;
  - Have a satisfactory record of performance;
  - Have a satisfactory record of integrity and ethics;
  - Be otherwise qualified and eligible to receive an award.
22. Successful bidder will pay or cause to be paid, without cost or expenses to County, all FICA, FUTA/SUTA and Federal Income Withholding Taxes of all employees, and all wages and benefits as required by Federal or State law. Successful bidder's officers, agents and/or employees will not be entitled to any benefits of an employee or elected official of County, including, but not limited to, benefits associated with County's civil service system.
23. Any contract award to a successful bidder will be in effect until (a) the contract expires, (b) delivery and acceptance of products, and/or performance of services ordered, or (c) terminated by County with thirty day's written notice prior to cancellation.
24. County reserves the right to enforce performance of any contract awarded hereunder in any manner prescribed by law or deemed to be in the best interest of the County in the event of breach or default by successful bidder; County reserves the right to terminate any contract immediately in the event a successful bidder fails to:
- A. Meet schedules;
  - B. Pay any required fees or taxes; or
  - C. Otherwise perform in accordance with the specifications.
25. Successful bidder shall defend, indemnify and save harmless County and all its elected officials, officers, agents and employees from all suits, actions, or other claims of any character, name and description brought for or on account of any injuries or damages received or sustained by any person, persons, or property on account of any negligent act or fault of the successful bidder, or of any agent, employee, subcontractor or supplier of successful bidder in the execution of, or performance under, any contract which may result from bid award or which arises from any event or casualty happening on or within County premises themselves or happening upon or in any halls, elevators, entrances, stairways or approaches of or to such County facilities. Successful bidder shall pay any judgment with costs which may be obtained against County growing out of such injury or damages, and shall, upon request, provide a defense to County by counsel reasonably acceptable to County. Successful bidder's indemnity hereunder shall include, but is not limited to, claims relating to patent, copyright or trademark infringement, and the like, arising out of the goods and services provided by successful bidder.
26. Successful bidder shall warrant that all items/services shall conform with the specifications and/or all warranties provided under the Uniform Commercial Code and be free from all defects in material, workmanship and the like. Items supplied under a contract pursuant to this Request for Bids shall be subject to County's approval. Items found to be defective or not meeting specifications shall be replaced by successful bidder

within two business days at no expense to County. Items not picked up within one (1) week after notification shall be deemed a donation to County and may be used or disposed of at County's discretion and without waiver of any other rights of County as to the item's nonconformity.

27. This document and any disputes arising hereunder shall be governed and construed according to the laws of the State of Texas, and will be performable exclusively in Hidalgo County, Texas.
28. The successful bidder shall not assign, sell, transfer or convey its rights under any awarded contract, in whole or in part, without the prior written consent of County.

## BID BOND

KNOWN ALL MEN BY THESE PRESENTS, that we, the undersigned,

\_\_\_\_\_ as

Principal \_\_\_\_\_ and

\_\_\_\_\_ as Surety, are hereby held

and \_\_\_\_\_ firmly \_\_\_\_\_ bound \_\_\_\_\_ unto

\_\_\_\_\_ as Owner in the penal sum of \$ \_\_\_\_\_

for the payment of which, well and truly to be made, we hereby jointly and severally bind

ourselves, our heirs, executors, administrators, successors an assigns.

**Signed, this \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_.**

The condition of the above obligation is such that whereas the Principal has submitted to

\_\_\_\_\_ a certain Bid, attached hereto and

hereby made a part hereof to enter a contract in writing, for the

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

NOW THEREFORE,

- (a) If said Bid shall be rejected, or in the alternate,
- (b) If said Bid shall be accepted and the Principal shall execute and deliver a contract in the Form of Contract attached hereto (properly completed in accordance with said Bid) and shall furnish a bond for his faithful performance of said contract and for the payment of all persons performing labor or using furnishing materials in connection therewith, and shall in all other 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.

The Surety, for value received, hereby stipulates and agrees that the obligations of said Surety and its bond shall be in no way impaired or affected by any extension of the time within which the Owner may accept such Bid; and said Surety does hereby waive notice of any extension.

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

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

\_\_\_\_\_  
SURETY

SEAL:

BY: \_\_\_\_\_

# **EXHIBIT “A”**

## **SPECIFICATIONS:**

Hidalgo County – Urban County Program  
City of Hidalgo – 2016 Parks, Recreational Facility Improvements  
Bid No.: 5016/17-35-0306-5000-3500-UCP-GVG

## **SCOPE OF WORK, SPECIFICATION REQUIREMENTS AND OTHER TERMS & CONDITIONS:**

The County Of Hidalgo requests proposals for:  
“City of Hidalgo – 2016 Parks, Recreational Facility Improvements”  
(See attached specifications as prepared by Javier Hinojosa Engineering)

### **Engineering Firm Contact:**

Javier Hinojosa  
416 E Dove Avenue  
McAllen, TX 78504  
956-668-1588

### **City Contact:**

City of Hidalgo  
Julian Gonzalez, City Manager  
956-843-2286

### **Hidalgo County-Urban County**

#### **Program Contact:**

Guadalupe Garcia, Program Coordinator  
956-787-8127



# CIVIL TECHNICAL SPECIFICATIONS

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**SECTION 01000**  
**SPECIAL PROVISIONS**

1. The City of Hidalgo reserves the right to remove any items within the proposal in order to meet the budget.
2. It shall be the Contractor's responsibility to locate underground utilities, whether shown or not shown on the drawings, sufficiently in advance of operations to preclude damage to same.
3. Water, sewer, or other utility services shall not be interrupted. Any damages to existing utilities will be Contractor's responsibility.
4. In the event of damage to underground facilities, whether shown or not shown in the drawings, the Contractor shall make the necessary repairs to place the facilities back in service at no increase in the Contractor's price and all such repairs shall conform to the requirements of the company or agency servicing the facility.
5. The Contractor shall exercise extra care to prevent damage to all other structures in the area including buildings, fence, roads, pipelines, utilities, etc., whether publicly or privately owned.
6. Until acceptance by the Engineer of any part or all of the construction, as provided for in the plans and these specifications, it shall be under the charge and care of the contractor, and he shall take every necessary precaution against injury or damage to any part of the work. The Contractor shall rebuild, repair, restore and make good, at his own expense, all injuries or damage to any portion of the work before its completion and acceptance.
7. In case the Contractor deems extra compensation is due him for proposed work not covered in the contract, the Contractor shall notify the Engineer in writing of his claim for such extra compensation before he begins the work. Failure on the part of the Contractor to give such notification shall constitute a waiver of claim for such extra compensation. The Contractor shall not proceed until a written Change Order is approved by the Owner, Engineer, and Contractor.

8. Upon failure of the Contractor to satisfactorily repair or to remove and replace) rejected work or materials immediately after receiving formal notice from the Engineer, the Owner may recover for such defective work or materials on the Contractor's bond, or by action a court having proper jurisdiction over such matters, or may employ labor and equipment and satisfactorily repair or remove and replace such work and charge the cost of the same to the Contractor, which cost will be deducted from any money due him from this contract.
9. Prospective bidders should make a careful examination of the project site.
10. Contractor shall review his overall method and schedule of construction with the City Prior to construction for proper coordination of inspection.
11. Contractor shall repair all asphalt pavement and concrete curb, gutter, sidewalk, or drainage structures damaged during construction.
12. The Contractor shall repair any landscaped areas, fences, etc. damaged during construction.
13. No open trenches or excavation shall be left open overnight.
14. The Contractor shall be responsible for providing at no additional cost to the owner all costs associated with all protection measures that will be required by the construction/demolition activities to safeguard the health, safety and welfare of the public.
15. Contractor to provide any and all temporary graphic construction signs, directional signs and any other signs that may be required during construction.
16. The Contractor shall coordinate all work for this project site with Mr. Robert Segura with the City of Hidalgo (956-843-2286) prior to start of construction in order to provide for inspection of the project.
17. Contractor to insure the safety of the public by providing proper barricading through all construction areas.

18. The Contractor shall be responsible for all erosion control methods required for the project including protection of all existing drainage structures in the project site.
19. The Contractor shall be responsible for applying and paying all permit fees from the City of Hidalgo and electrical company required for this project.
20. The Contractor shall submit shop drawings to be approved by the City and Engineer prior to construction of facility including all color selections.

## **SECTION 02220 SUBGRADE PREPARATION**

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### **PART 1 – GENERAL**

#### **1.01 GENERAL DESCRIPTION OF WORK:**

- A. This work shall consist of scarifying, blading and rolling the sub-grade to obtain a uniform texture and provide as nearly as practical a uniform density for the 6 inches of the sub-grade.

### **PART 2 - EXECUTION**

#### **3.01 CONSTRUCTION METHODS:**

- A. All preparing of the right-of-way and/or clearing and grubbing shall be completed before starting the sub-grade preparation.
- B. The sub-grade shall be scarified and shaped in conformity with the typical sections and the lines and grades indicated or as established by the ENGINEER by the removal of existing material or addition of approved material.
- C. All unsuitable material shall be removed and replaced with approved material.
- D. All foundations, walls or other objectionable material shall be removed to a minimum depth of 18-inches under all structures and 12-inches under areas to be vegetated. All holes, ruts and depressions shall be filled with approved material.
- E. The surface of the sub-grade shall be finished to the lines and grades as established and be in conformity with the typical sections indicated.
- F. Any deviation in excess of ½ inch cross section and in a length of 10 feet measured longitudinally shall be corrected by loosening, adding or removing material, reshaping and compacting by sprinkling and rolling.
- G. Sufficient sub-grade shall be prepared in advance to insure satisfactory prosecution of the work.
- H. The CONTRACTOR will be required to set blue tops for the sub-grade on centerline, at quarter points and curb lines or edge of pavement at intervals not exceeding 50 feet.
- I. All suitable material removed may be utilized in the sub-grade with the approval of the ENGINEER. All other material required for completion of the sub-grade shall also be subject to approval by the ENGINEER.

- J. Sub-grade materials on which structures shall be placed shall be compacted by approved mechanical tamping equipment to a dry density of the total material of not less than 95 percent nor more than 100 percent of the maximum dry density as determined in accordance with SDHPT Test Method Tex-114-E.
- K. Sub-grade materials on which planting or turf will be established shall be compacted to a minimum of 85 percent of the maximum dry density as determined in accordance with SDHPT Test Method Tex-114-E.
- L. Tests for density will be made as soon as possible after compacting operations are completed. If the material fails to meet the density specified, it shall be reworked as necessary to obtain the density required.
- M. Just prior to placing any base materials, density and moisture content of the top 6 inches of compacted sub-grade shall be checked and if tests show the density to be more than 2 percent below the specified minimum or the moisture content to be more than 3 percent above or below the optimum, the sub-grade shall be reworked as necessary to obtain the specified compaction and moisture content.
- N. Proof Rolling is require before placing base material in conformity with Item 02686 "Proof Rolling"
- N. When lime stabilization of the sub-grade is specified, the lime is to be added in accordance with Section 02240, Lime Stabilization.

## **PART 4 – MEASUREMENT AND PAYMENT**

### **4.01 MEASUREMENT:**

- A. All acceptable sub-grade preparation will be measured by the square yard.
- B. The measured area includes the entire width of the roadway for the entire length as indicated.

### **4.02 PAYMENT:**

- A. The accepted quantities of sub-grade preparation will be paid for at contract unit bid price per square yard.
- B. When not listed as a separate contract pay item, sub-grade preparation shall be considered as incidental work, and the cost thereof shall be included in such contract pay item(s) as are provided in the proposal contract.

C. Compensation, whether by contract pay item or incidental work will be for furnishing all materials, labor, equipment, tools and incidentals required for the work, all in accordance with the plans and these specifications.

**END OF SECTION**

**SECTION 02601**  
**FLEXIBLE BASE**

**PART I - GENERAL**

**1.01 GENERAL DESCRIPTION OF WORK:**

- A. This work shall consist of furnishing and placing a foundation course for surface courses or for other base courses.
- B. Flexible base shall be composed of either caliche (argillaceous limestone, calcareous or calcareous clay particles, with or without stone, conglomerate, gravel, sand or other granular materials), crushed stone, gravel, iron ore topsoil, shell, or crushed slag.
- C. Flexible base shall be constructed as specified herein in one or more courses in conformance with the details, lines and grades shown on the plans, and as established by the ENGINEER.

**PART 2 -PRODUCTS**

**2.01 MATERIALS:**

- A. Materials for flexible base shall be crushed or uncrushed as necessary to comply with the requirements hereinafter specified.
- B. Materials shall consist of durable, coarse aggregate particles mixed with approved binding materials.

**2.02 LIME STABILIZATION:**

- A. Where shown on the plans, or directed by the ENGINEER, material for flexible base shall be lime stabilized in accordance with the provisions of Section 02240.

**2.03 TYPES:**

- A. Type A - Crushed or broken aggregate (excluding gravel aggregate).
- B. Type B - Gravel Aggregate
- C. Type F - Caliche

**2.04 GRADES:**



- A. Unless otherwise shown on the plans or directed by the ENGINEER, the final course of base material shall consist of Grades 1, 2, 3, or 4, as specified in Table 02601-1.
- B. Base courses or subbase materials, unless otherwise noted on the plans or directed by the ENGINEER, may consist of Grades 1, 2, 3, or 4, as specified in Table 02601-1.
- C. All grades shall, when tested in accordance with standard laboratory test procedures, meet the physical requirements set forth in Table 02601-1.
- D. Testing of flexible base materials shall be in accordance with the following test procedures:

<u>TEST</u>	<u>TESTING PROCEDURE</u>
Preparation for soil constants and sieve analysis	TEX-101-E
Liquid Limit	TEX-104-E
Plastic Limit	TEX-105-E
Plasticity Index	TEX-106-E
Sieve Analysis	TEX-110-E
Wet Ball Mill	TEX-116-E
Triaxial Test	TEX-117-E (Part I or II)

- E. Unless otherwise specified on the plans, samples for testing the material for Soil constants, Gradation and Wet Ball Mill shall be taken prior to the compaction operations.
- F. Unless otherwise specified on the plans, samples for triaxial tests shall be taken from the stockpile or from production, as directed by the ENGINEER, where stockpiling is required and from production where stockpiling is not required.

**TABLE 02601-1**

**PHYSICAL REQUIREMENTS FOR FLEXIBLE BASE MATERIALS**

TYPES	GRADES							
	Grade 1		Grade 2		Grade 3		Grade 4	
	Triaxial Class 1, Min. compressive strength, psi: 45 to 0 psi lateral pressure and 175 at 15 psi lateral pressure		(Triaxial Class 1 to 2.4) Min. compressive strength, psi: 35 to 0 psi lateral pressure and 175 at 15 psi lateral pressure		(Unspecified Triaxial Class)		(Unspecified Triaxial Class)	
<b>TYPE A</b>	Retained on Sq. Sieve	%	Retained on Sq. Sieve	%	Retained on Sq. Sieve	%	Retained on Sq. Sieve	%
Crushed or Broken Aggregate (excluding gravel aggregate)	1-3/4	0	1-3/4	0-10	1-3/4	0-10	As Shown on Plans	
	7/8"	10-35	No. 4	45-75	No. 40	60-85		
	3/8"	30-50	No. 40	60-85	Max LL	45		
	No. 4	45-65	Max LL	40	Max PI	15		
	No. 40	70-85	Max PI	12	Wet Ball			
	Max LL	35	Wet Ball		Bill Amt	55		
	Max PI	10	Wet Ball Bill Amt	40	Wet Ball Bill Amt	40		
	Wet Ball Bill Amt	40	Max Increase in Passing No. 40	20	Max Increase in Passing No. 40	20		
	Max Increase in Passing No. 40	20						
<b>TYPE B</b>	Retained on Sq. Sieve	%	Retained on Sq. Sieve	%	Retained on Sq. Sieve	%	Retained on Sq. Sieve	%
Gravel Aggregate	N/A		1-3/4	0-10	2-3/4"	0	As Shown on Plans	
			No. 4	30-75	No. 40	45-65		
			No. 40	70-85	Max LL	35		
			Max LL	35	Max PI	12		
			Max PI	12				
			Max PI	12	Max LL	35		
			No. 4	45-65	No. 40	45-65		
			No. 40	50-70	Max LL	35		
			Max LL	35	Max PI	12		
			Max PI	12				

<b>TYPE F</b>	Retained on Sq. Sieve	%	Retained on Sq. Sieve	%	Retained on Sq. Sieve	%	Retained on Sq. Sieve	%
Caliche	N/A		1-3/4	0	1-3/4	0	As Shown on Plans	
			No. 4	45-75	No. 40	50-85		
			No. 40	50-85	Max LL	40		
			Max LL	40	Max PI	12		
			Max PI	12				

G. Materials exhibiting reasonably close conformity with the specified gradation and plasticity index are defined by the following criteria:

1. The ENGINEER may accept the material, providing not more than 2 of 10 consecutive gradation tests performed are outside the specified limits on any individual or combination of sieves by no more than 5% and where no two consecutive tests are outside the specified limits.
2. The ENGINEER may accept the material providing not more than 2 of 10 consecutive plasticity index samples tested are outside the specified limit by no more than two points and where no two consecutive tests are outside the specified limit.

## 2.05 STOCKPILING:

- A. When specified on the plans, the material shall be stockpiled prior to delivery on the road. The stockpile shall be not less than the height indicated and shall be made up of layers of material not to exceed the depth shown on the plans.
- B. After a sufficient stockpile has been constructed as specified on the plans, the CONTRACTOR may proceed with loading from the stockpile for delivery to the road.
- C. In loading from the stockpile for delivery to the road, the material shall be loaded by making successive vertical cuts through the entire depth of the stockpile.
- D. If the CONTRACTOR elects to produce the Type A material from more than one material or more than one source, each material shall be crushed separately and placed in separate stockpiles so that at least 75 percent of the material in the course aggregate stockpiles will be retained on the No. 4 sieve and at least 70 percent of the material in the fine aggregate stockpile will pass the No. 4 sieve.
- E. The materials shall be combined in a central mixing plant in the proportions determined by the ENGINEER to produce a uniform mixture which meets all

of the requirements of the specification. In the event that combinations of the materials produced fail to meet all of the specification requirements, the CONTRACTOR will be required to secure other materials which will meet specifications requirements.

- F. The central mixing plant shall be of either the batch or continuous flow type, and shall be equipped with feeding and metering devices which will add the materials into the mixer in the specified quantities.
- G. Mixing shall continue until a uniform mixture is obtained.

### **PART 3 - EXECUTION**

#### **3.01 PREPARATION OF SUBGRADE:**

- A. The roadbed shall be excavated and shaped in conformity with the typical sections shown on the plans and to the lines and grades as established by the ENGINEER.
- B. All unstable or otherwise objectionable material shall be removed from the subgrade and replaced with approved material.
- C. Flexible base shall not be placed until the Contractor has verified by proof rolling that the subgrade has been prepared and compacted in conformity with Standard Specification Item 02220, "Subgrade Preparation," to the typical sections, lines and grades indicated on the Drawings. Any deviation shall be corrected and proof rolled prior to placement of the flexible base material.
- D. All holes, ruts and depressions shall be filled with approved material and, if required, the subgrade shall be thoroughly wetted with water and reshaped and rolled to the extent directed in order to place the subgrade in an acceptable condition to receive the base material.
- E. The surface of the subgrade shall be finished to line and grade as established and in conformity with the typical section shown on plans. Any deviation in excess of 1/2 inch in cross section and in a length of 16-feet measured longitudinally shall be corrected by loosening, adding or removing material, reshaping and re-compacting by sprinkling and rolling.
- F. Sufficient subgrade shall be prepared in advance to insure satisfactory execution of the work.

- G. Material excavated in the preparation of the subgrade shall be utilized in the construction of adjacent shoulders and slopes or otherwise disposed of as directed. Any additional material required for the completion of the shoulders and slopes shall be secured from sources indicated on plans or as directed by the ENGINEER.

### 3.02 PLACEMENT OF FIRST COURSE - TYPE A, TYPE B, TYPE F MATERIAL:

- A. Immediately before placing the base material, the subgrade shall be checked as to conformity with grade and section.
- B. The material shall be delivered in approved vehicles of a uniform capacity, and it shall be the charge of the CONTRACTOR that the required amount of specified material shall be delivered to each 100-foot station.
- C. Material deposited upon the subgrade shall be spread and shaped the same day.
- D. In the event that inclement weather, or other unforeseen circumstances, renders the spreading of the material during the first 24-hour period impractical, the materials shall be scarified and spread as directed by the ENGINEER.
- E. Throughout the entire operation the material shall be sprinkled, if directed, and shall be maintained by blading and, upon completion, shall be smooth and shall conform to the typical section indicated on the Drawings and to the established lines and grades, shall then be bladed, dragged and shaped to conform to typical sections as shown on plans.
- F. Each lift shall be sprinkled as required to bring the material to optimum moisture content, then compacted to the extent necessary to provide not less than 95 percent nor more than 100 percent of the maximum dry density as determined in accordance with Test Method Tex-114-E. In addition to the requirements specified for density, the full depth of flexible base material shall be compacted to the extent necessary to remain firm and stable under construction equipment. After each section of flexible base material is completed, tests, as necessary, will be made by the Engineer or designated representative. As a minimum, three in-place density tests per section per day will be taken. If the material fails to meet the density requirements, it shall be reworked as necessary to meet these requirements.
- G. All areas and "nests" of segregated coarse or fine material shall be removed and replaced with well graded material, as directed by the ENGINEER.

- H. If additional binder is considered desirable or necessary after the material is spread and shaped, it shall be furnished and supplied in the amount directed by the ENGINEER. Such binder material shall be carefully and evenly incorporated with the material in place by scarifying, harrowing, brooming or by other approved methods.
- I. The course shall be compacted by methods of compaction hereinafter specified as the "Ordinary Compaction" method or the "Density Control" method of compaction as indicated on the plans, or as directed by the ENGINEER.
  - 1. When the "Ordinary Compaction" method is to be used, the following provisions shall apply:
    - a) The course shall be sprinkled as required and rolled with approved compaction equipment as directed until a uniform compaction is secured. Throughout this entire operation, the shape of the course shall be maintained by blading. Upon completion, the surface shall be smooth and in conformity with the typical sections shown on plans and the established lines and grades.
    - b) In the area on which pavement is to be placed, any deviation in excess of 1/4 inch in cross section and in a length of 16-feet measured longitudinally shall be corrected by loosening, adding or removing approved material, as required reshaping and re-compacting by sprinkling and rolling.
    - c) All irregularities, depressions and weak spots which develop in the laid course shall be corrected immediately by scarifying the areas affected, adding approved material as required, reshaping and recompacting by sprinkling and rolling.
  - 2. When the "Density Control" method of compaction is to be used, the following provisions shall apply:
    - a) The course shall be sprinkled as required and compacted to the extent necessary to provide not less than the percent density as hereinafter specified under "Density".
    - b) In addition to the requirement specified for density, the full depth of the flexible base shown on the plans shall be compacted to the extent necessary to remain firm and stable under construction equipment.
    - c) After each section of flexible base is completed, tests as necessary will be made by the ENGINEER. If the material fails to meet the density

requirements, it shall be reworked as necessary to meet these requirements.

- d) Throughout this entire operation, the shape of the course shall be maintained by blading, and the surface upon completion shall be smooth and in conformity with the typical sections shown on the plans and to the established lines and grades.
- e) In the areas on which pavement is to be placed, any deviation in excess of 1/4 inch in cross section and 16 feet in length, measured longitudinally, shall be corrected by loosening, adding or removing approved material as required, reshaping and recompacting by sprinkling and rolling.
- f) All irregularities, depressions, and weak spots which develop shall be corrected immediately by scarifying the areas affected, adding approved material as required, reshaping and recompacting by sprinkling and rolling. Should the base course, due to any reason or cause, lose the required stability, density or finish before the surfacing is complete; it shall be re-compacted and refinished at the sole expense of the CONTRACTOR.

### 3.03 PLACEMENT OF SUCCEEDING COURSES - ALL MATERIAL TYPES:

- A. Construction methods shall be the same as prescribed for the first course.
- B. Prior to placing the surfacing on the completed base, the base shall be "dry cured" to the extent directed by the ENGINEER.

### 3.04 REWORKING AN EXISTING BASE COURSE

- A. Existing base courses shall be reworked in accordance with TxDOT Item 251, or as directed by the ENGINEER, and result in a section that conforms the approved lines and grades.

### 3.05 DENSITY CONTROL:

- A. When the "Density Control" method of compaction is indicated on the plans, each course of flexible base shall be compacted to the percent density shown on the plans.
- B. The testing will be as outlined in Test Method Tex-114-E.
- C. It is the intent of this specification to provide that the part of the base included in the top 8 inches, immediately below the finished surface of the

roadway, be not less than 100 percent of the density, as determined by the compaction ratio method.

- D. Field density determination shall be made in accordance with Test Method Tex-115-E.

### 3.06 TOLERANCES:

- A. Flexible base will be measured by the square yard of surface area of completed and accepted work based on the thickness of flexible base as shown on the plans.
  - 1. The ENGINEER may accept the work providing not more than 25 percent of the density tests performed each day are outside the specified density by no more than three pounds per cubic foot and where no two consecutive tests on continuous work are outside the specified limits.

## **PART 4 - MEASUREMENT AND PAYMENT**

### 4.01 MEASUREMENT:

- A. Flexible base will be measure by the square yard of surface area of completed and accepted work based on the thickness of flexible base as shown on the plans.
  - 1. The flexible base shall be measured for depth by the units of 2,000 square yards minimum, with one measurement taken at a location selected by the ENGINEER. There shall be a minimum of three (3) locations measured per project.
  - 2. In that unit where flexible base is deficient by more than 1/2 inch in thickness, the deficiency shall be corrected by scarifying, adding material as required, reshaping and re-compacting by sprinkling and rolling.
    - 1. No additional payment over the contract unit price will be made for any flexible base of a thickness exceeding that required by plans.
- B. The CONTRACTOR shall schedule his operations in such a manner as to facilitate the measurement of the pay item.
- D. The ENGINEER may accept the work provided no more than 20% depth tests performed are deficient by not more 1/2 inch and where no two consecutive tests on continuous work are outside the specified depth.



#### 4.02 PAYMENT:

- A. The accepted quantities of flexible base of the type, grade, and compaction method specified will be paid at the contract unit bid price per square yard, complete and in place.
- B. Where "Ordinary Compaction" is used, all sprinkling, rolling, and manipulation required will not be paid for directly, but will be incidental to this bid items.
- C. The unit prices bid shall each be full compensation for shaping and fine grading the roadbed; for securing and furnishing all materials, including all royalty and freight involved; for furnishing scales and labor involved in weighing the material when required; for loosening, blasting, excavating, screening, crushing and temporary stockpiling when required; for loading all materials for all hauling and delivering on the road; for spreading, mixing, blading, dragging, shaping and finishing, and for all manipulation, labor, tools and incidentals necessary to complete the work.

**END OF SECTION**

## **SECTION 02610**

### **PRIME COAT**

#### **PART 1 - GENERAL**

##### **1.01 GENERAL DESCRIPTION:**

- A. Prime coat shall consist of the application of asphaltic materials on a newly completed base course and/or other approved area, which shall be applied in accordance with these specifications, as shown on the plans, and as directed by the ENGINEER.

##### **1.02 QUALITY ASSURANCE:**

###### **A. Test and Certification of Bituminous Materials.**

1. Bituminous materials to be tested in accordance with the requirements of AASHTO M-82 and sampled in conformance with AASHTO T-40.
2. Supply, at the time of delivery of each shipment of asphalt, two certified copies of test reports from the supplying vendor to the ENGINEER.
3. Test reports shall indicate name of vendor, type and grade of asphalt delivered, date and point of delivery, quantity delivered, delivery ticket number, purchase order number, and result of specified tests.
4. The test report shall be signed by an authorized representative of the vendor and certify that the product delivered conforms to the specifications for type and grade indicated.
5. Certified test reports and the testing required in the preparation of such report shall be at no cost to the City.
6. Final acceptance of bituminous materials shall be dependent on the determination by the ENGINEER that the material meets prescribed standards.

#### **PART 2- PRODUCTS**

##### **2.01 MEDIUM CURING CUTBACK ASPHALT:**

- A. Medium-curing liquid asphalt, designated by the letters MC, shall consist of an uncracked petroleum base stock, produced by the processing of asphaltic or semi-asphaltic base crude petroleum, blended with a kerosene-type solvent. The base stock for all MC materials shall be straight run asphalt produced within the penetration range of 100 to 300, and the end point of the

kerosene type solvent shall not exceed 525° F. Medium curing liquid cutback asphalt shall be free from water and show no separation.

B. Medium curing cutback asphalt shall consist of materials specified above and shall conform to the requirements set forth in Table 2610-1.

TABLE 2610-1

Specification Designation	AASHTO Test Method	ASTM Test Method	MC 30	MC 70	MC 250	MC 800	MC 3000
Flash Point (Open Cleave) °F, Min.	T 48	D 92	100	100	150	150	150
Viscosity, 140°F, Kinematic, CS	T 201	D 2170	30 - 60	70 - 140	250 - 500	800 - 1600	3000 - 6000
Furol Viscosity at: 77° F (Sec.) 122° F (Sec.) 140° F (Sec.) 180° F (Sec.)	T 72	D 88	75-150	60-120	125-250	100-200	300-600
Distillation Distillate (% of Total Distillate to 680° F)	T 78	D 402					
437° F			0-25	0-20	0-10	0	0
500° F			40-70	25-60	20-55	10-35	0-15
600° F			75-93	75-90	70-85	65-80	50-75
Residue from Distillation to 680° F Volume % by Difference Min.			50	55	67	75	80
Tests on Residue from Distillation Penetration at 77° F	T 49	D 5	120 - 250	120 - 250	120 - 250	120 - 250	120 - 250
* Ductility 77° F, cm, Min.	T 51	D 113	100	100	100	100	100
Solubility in CCl <sub>4</sub> , % Min.	T 44		99.5	99.5	99.5	99.5	99.5

Water, % Max.	T 55	D 95	0.2	0.2	0.2	0.2	0.2
Reaction to Spot Test	T 102**		0	0	0	0	0

\* If penetration of residue is more than 200 and its ductility at 77° F is less than 100, the material will be acceptable if the ductility at 60° F is greater than 100.

\*\* Using 85% Standard Naptha and 15% Xylene.

NOTE: Viscosity tests may be made by either Kinematic or Furol test methods.

C. Unless otherwise noted on the plans or directed by the ENGINEER, cutback asphalt Grade MC-30 shall be used.

## 2.02 BLOTTER MATERIAL:

A. Supply blotter material consisting of native sand and/or sweepings from base course.

B. Native sand shall be local material obtained from approved sources as approved by the ENGINEER.

## PART 3 - EXECUTION

### 3.01 CONSTRUCTION METHODS:

A. Unless otherwise specified on the plans or required by the ENGINEER, only asphaltic material shall be used. Where required, a combination of asphaltic and blotter material shall be used.

B. Application of Asphaltic Materials Only.

1. Apply prime coat to prepared surface when ambient air temperature is above 40° F and rising and shall not be applied when the ambient air temperature is below 50° F and falling.

2. Apply prime coat to surfaces that have been cleaned by sweeping or other approved methods and where base is thoroughly dry and satisfactory for receiving prime coat.

3. Apply prime coat to cleaned base, at a rate of 0.2 to 0.5 gallons per square yard of surface area, using an approved type of self-propelled pressure distributor so constructed and operated to distribute the material evenly and smoothly.

4. Provide necessary facilities for the determination of temperature of asphaltic material in all heating equipment and distributors; and for

determination of rate at which it is applied; and for securing uniformity at the junction of two distributor loads.

5. Keep in clean and good working condition all storage tanks, piping, reports, booster tanks and distributors used in the storage and handling of asphaltic materials.
6. Operate all associated equipment in a manner such that there is no contamination of asphaltic material with foreign material.
7. Calibrate distributor and furnish ENGINEER with an accurate and satisfactory record of such calibrations.
8. Recalibrate distributor, in a manner satisfactory to the ENGINEER, after the beginning of work, should the yield on the asphaltic material applied appear to be in error.
9. No traffic, hauling or placing of subsequent courses shall be permitted over freshly applied prime coat until authorized by the ENGINEER.
10. Apply asphaltic material at a temperature within 15° F of temperature of application selected by the ENGINEER based on temperature viscosity relationship noted in Table 2610-1.
11. Maintain surface until work is Blotter Material.

C. Application of Asphaltic and Blotter Material

1. Haul blotter material in vehicles of uniform capacity and placed on shoulders at a spacing designated by the ENGINEER.
2. After application of asphaltic material as specified above, cover surface with blotter material as directed by the ENGINEER.
3. After application of blotter material, drag surface with approved drag broom, evenly and smoothly distributing the blotter material. Brooming or dragging operation shall continue, as directed by the ENGINEER, until the course has properly cured under traffic.

## **PART 4 - MEASUREMENT AND PAYMENT**

### **4.01 PRIME COAT:**

- A. When listed as a separate contract pay item "Prime Coat", asphaltic material for prime coat will be measured for payment at point of delivery on the project

in gallons at applied temperature. Payment will be paid at the unit bid price for "Prime Coat".

- B. When not listed as a separate contract pay item, prime coat shall be considered as incidental work, and the cost thereof shall be included in such contract pay item(s) as are provided in the proposal contract.
- C. Compensation, whether by contract pay item or incidental work will be for furnishing all material, labor, equipment, tools and incidentals required for the work, all in accordance with the plans and these specifications.

#### 4.02 BLOTTER MATERIALS:

- A. Blotter material will be considered incidental to asphaltic material for prime coat with no direct payment.

**END OF SECTION**

## **SECTION 02612**

### **HOT MIX ASPHALT CONCRETE PAVEMENT**

#### **PART 1 - GENERAL**

##### **1.01 DESCRIPTION:**

- A. Hot mix asphalt concrete (HMAC) pavement shall consist of a binder course, a leveling up course, a surface course or a combination of the courses as shown on the plans, or as directed by the ENGINEER.
- B. HMAC pavement shall be composed of a compacted mixture of mineral aggregate and asphaltic material, constructed on previously completed and approved subgrade, subbase course, base course, or existing pavement.
- C. HMAC pavement shall be in accordance with the specifications herein and in conformity with the lines, grades, quantities and typical sections in the contract and/or as directed by the ENGINEER.

##### **1.02 QUALITY CONTROL:**

- A. HMAC pavement and its constituent part shall conform to the ASTM, AASHTO and/or TxDOT test methods noted below.

#### **PART 2 - PRODUCTS**

##### **2.01 ASPHALTIC MATERIALS:**

- A. Asphalt cement binders shall be uncracked petroleum asphalt and shall be carefully refined, by steam, vacuum, or solvent, from asphaltic or semi-asphaltic base crude petroleum at a temperature not to exceed 700° F. Asphalt cements shall be free from thermal decomposition products and shall not be blended with any materials which have been subjected to cracking or produced from a crude petroleum source other than that of the original material. The asphalt cement shall not contain residues from non-asphaltic sources. Asphalt cement shall be homogeneous, free from water, and shall not foam when heated to 347° F.
- B. Paving asphalt shall be classified by penetration or viscosity and shall conform to the requirements set forth in one of the following tables as designated by the ENGINEER. The CONTRACTOR may supply asphalt meeting the requirements of one of the following tables provided that the CONTRACTOR obtains prior approval of the ENGINEER and with the provision that once approval has been obtained, that the CONTRACTOR will remain with that grade throughout the project.

**TABLE 2612-1**

Specification	AASHTO Test	ASTM Test						
Designation	Method	Method	40 to 50	60 to 70	85 to 100	120 to 150	150 to 200	200 to 250
Flash Point (Open Cup) Min	T48	D92	--	450	450	450	450	350
Penetration of Orig. Sample at 77° F	T49	D5	40 to 50	60 to 70	85 to 100	120 to 150	150 to 200	200 to 250
Thin-Film Oven Loss, Hours at 325°F, % Max	T179	D1754	0.75	0.75	0.75	0.75	1.00	1.00
Test of Residue from Thin-Film Oven Test; % of Orig. Pen., Min.	T49	D5	52	50	50	50	50	50
Ductility at 77° F cm. after los at 325° F, Min.	T51	D113	50	50	100	100	100	100
Solubility in CCl <sub>4</sub> Min.	T44*	None	99.5	99.5	99.5	99.5	99.5	99.5
Reaction to Spot Test	T102**	None	0	0	0	0	0	0

\* Procedure No. 1 with CCl<sub>4</sub> substituted for CS<sub>2</sub>.

\*\* Using 85% Standard Naphtha Solvent and 15% Xylene.



**TABLE 2612-2**

TYPE-GRADE	OA-30		OA-175*8		OA-400	
	Min	Max	Min	Max	Min	Max
Penetration at 32° F, 200 g, 60 sec	15	--	--	--	--	--
Penetration at 77° F, 100 g, 5 sec	25	35	150	200	--	--
Penetration at 115° F, 50 g, 5 sec	--	65	--	--	--	--
Ductility at 77° F, 5 cm/min, cms; Original OA	2	--	70	--	--	--
Flash Point COC, °F	450	--	425	--	425	--
Softening Point, R&B, °F	185	--	95	130	--	--
Thin Film Oven Test, 1/8 in. Film 50 g, 5 hrs, 325° F, % Loss by wt.	--	0.4	--	1.4	--	20
Penetration of Residue, at 77° F, 100 g, 5 sec % of Original Pen	--	--	40	--	--	--
Ductility of Residue at 77°F, 5 cm/min, cms	--	--	--	100	--	--
Solubility in Trichloroethylene, %	99	--	99	--	99	--
Spot Test on Original OA	Neg		Neg		Neg	
Float Test at 122° F, sec	--	--	--	--	120	150
Test on 85 to 115 Pen. Residue* Residue by Wt., %	--	--	--	--	75	--
Ductility, 77° F, 5 cm/min: Original Res, cms	--	--	--	--	100	--
Subjected to Thin Film Test, cms	--	--	--	--	100	--

\*Determined by Vacuum Distillation (by evaporation if unable to reduce by vacuum).

\*\* For use with Latex Additive only.

**TABLE 2612-3**

PROPERTIES	AC-1.5		AC-3		AC-5		AC-10		AC-20		AC-40	
	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX
Viscosity, 140° F stokes ...	150	50	300	100	500	100	1000	200	2000	400	4000	800
Viscosity, 275° F stokes ...	0.7	--	1.1	--	1.4	--	1.9	--	2.5	--	3.5	--
Penetration, 77° F 100 g, 5 sec	250	--	210	--	135	--	85	--	55	--	35	--
Flash Point, COC, ° F	425	--	425	--	425	--	450	--	450	--	450	--
Solubility in trichloroethylene, percent ...	99	--	99	--	99	--	99	--	99	--	99	--
Test on residues from thin film oven test: Viscosity, 140° F stokes ...	--	450	--	900	1500	--	3000	--	6000	--	--	12000
Ductility, 77° F, 5 cms per min, cms	100	--	100	--	100	--	70	--	50	--	30	--
Spot Test	Negative for all grades											

- C. A minimum of two percent, by weight, latex additive (solids basis) shall be added to the OA-175 Asphalt or to AC-5 Asphalt when specified in the contract. The latex additive shall be governed by the following specifications:

The latex is to be an anionic emulsion of butadiene-styrene low-temperature copolymer in water, stabilized with fatty-acid soap so as to have good storage stability, and possessing the following properties:

Monomer ratio, B/S	70/30
Minimum solids content	67%
Solids content per gal. @ 67%	5.3 lbs.
Coagulum on 80-mesh screen	0.01% max.
Type Anti-oxidant	staining
Mooney viscosity of Polymer (M/L 4@212° F)	100 min.
pH of Latex	9.4 - 10.5
Surface tension	28-42 dynes/cm <sup>2</sup>

The finished latex-asphalt blend shall meet the following requirements:

Viscosity at 140° F, stokes	1500 max.
Ductility at 39.2° F, 1 cm. per min., cm.	100 min.

D. Asphalt content shall be within the limits noted below:

**Table 2612-4**

HMAC Type	Percent of Mixture by Weight	Percent of Mixture by Volume
"A"	3.5 - 7.0	8.0 - 16.0
"B"	3.5 - 7.0	8.0 - 16.0
"C"	3.5 - 7.0	8.0 - 16.0
"D"	4.0 - 8.0	9.0 - 19.0
"F"	3.5 - 6.5	8.0 - 16.0

- E. At the time of delivery of each shipment of asphalt, the vendor supplying the material shall deliver to the purchaser certified copies of the test report which shall indicate the name of the vendor, type and grade of asphalt delivered, date and point of delivery, quantity delivered, delivery ticket number, and results of the above-specified tests. The test report shall be certified and signed by an authorized representative of the vendor that the product delivered conforms to the specifications for the type and grade indicated.
- F. Until the certified test reports and samples of the material have been checked by the ENGINEER to determine their conformity with the prescribed requirements, the material to which such report relates and any work in which it may have been incorporated as an integral component will be only tentatively accepted by the City. Final acceptance will be dependent upon the determination of the ENGINEER that the material involved fulfills the requirements prescribed therefor. The certified test reports and the testing required in connection with the reports will be at the expense to the City.
- G. Unless otherwise specified in these specifications or in the Supplementary Specifications, the various grades of paving asphalt shall be applied at a temperature range of from 210° F to 325° F, the exact temperature to be determined by the ENGINEER.
- H. Paving asphalt shall be heated in such a manner that steam or hot oils will not be introduced directly into the paving asphalt during heating. The CONTRACTOR shall furnish and keep on the site, at all times, an accurate thermometer suitable for determining the temperature of the paving asphalt.
- I. HMAC asphalt shall be the grade having the highest penetration, within specified limits, to produce a mix having a maximum stability of the compacted mixtures.
- J. Only one (1) grade of asphalt shall be required unless otherwise shown on the plans or as required by the ENGINEER.

**2.02 AGGREGATES:**

A. HMAC aggregate will be tested in accordance with the following test standards:

- AASHTO T-30   Mechanic Testing
- AASHTO T-27   Passing No. 200 Sieve
- AASHTO T-89   Liquid Limit
- AASHTO T-96   Los Angeles Abrasion
- AASHTO T-104   Soundness (Magnesium Sulfate)
- ASTM C – 131   Resistance to Degradation
- ASTM C – 136   Sieve Analysis
- ASTM C – 2419   Sand Equivalence Value
- TxDOT Tex -106-E   Method of Calculating Plasticity Index of Solids
- TxDOT Tex-217 – F   (I & II) Determination of Deleterious Materials and Decantation Test
- TxDOT Tex-203 – F   Quality Tests for Mineral Aggregates

B. Aggregates shall have an abrasion of not more than 40 for all courses except the non-skid surface course, which shall have an abrasion of not more than 35.

C. When properly proportioned, HMAC aggregate shall produce a gradation which will conform to the limitations for classification for HMAC type shown below, or as directed by the ENGINEER.

D. Course aggregate to be crushed limestone rock or crushed gravel with hydrated lime or limestone filler. (Crushed gravel shall be per TxDOT Specifications.)

E. Binder aggregate to be composed of 15% crushed limestone screening or as directed by the engineer.

1. Type "A" - Course Graded Base Course

	Percent Aggregate by Weight or Volume
Passing 2" sieve.....	100
Passing 1-3/4" sieve.....	95 to 100
Passing 1-3/4" sieve, retained on 7/8" sieve.....	16 to 42
Passing 7/8" sieve, retained on 3/8" sieve .....	16 to 42
Passing 3/8" sieve, retained on No. 4 sieve .....	10 to 26
Passing No. 4 sieve, retained on No. 10 sieve.....	5 to 21
Total retained on No. 10 sieve.....	68 to 84
Passing No. 10 sieve, retained on No. 40 sieve.....	5 to 21
Passing No. 40 sieve, retained on No. 80 sieve.....	3 to 16
Passing No. 80 sieve, retained on No. 200 sieve.....	2 to 16
Passing No. 200 sieve.....	1 to 8

2. Type "B" - Fine Graded or Leveling-Up Course

	Percent Aggregate by Weight or Volume
Passing 1" sieve.....	100
Passing 7/8" sieve.....	95 to 100
Passing 7/8" sieve, retained on 3/8" sieve .....	21 to 53
Passing 3/8" sieve, retained on No. 4 sieve.....	11 to 42
Passing No. 4 sieve, retained on No. 10 sieve.....	5 to 26
Total retained on No. 10 sieve.....	58 to 74
Passing No. 10 sieve, retained on No. 40 sieve.....	6 to 32
Passing No. 40 sieve, retained on No. 80 sieve.....	4 to 21
Passing No. 80 sieve, retained on No. 200 sieve.....	3 to 21
Passing No. 200 sieve.....	1 to 8

3. Type "C" - Course Graded Surface Course

	Percent Aggregate by Weight or Volume
Passing 7/8" sieve.....	100
Passing 5/8" sieve.....	95 to 100
Passing 5/8" sieve, retained on 3/8" sieve .....	16 to 42
Passing 3/8" sieve, retained on No. 4 sieve.....	11 to 37
Passing No. 4 sieve, retained on No. 10 sieve.....	11 to 32
Total retained on No. 10 sieve.....	54 to 74
Passing No. 10 sieve, retained on No. 40 sieve.....	6 to 32
Passing No. 40 sieve, retained on No. 80 sieve.....	4 to 27
Passing No. 80 sieve, retained on No. 200 sieve.....	3 to 27
Passing No. 200 sieve.....	1 to 8

4. Type "D" - Fine Graded Surface Course

	Percent Aggregate by Weight or Volume
Passing 1/2" sieve.....	100
Passing 3/8" sieve.....	85 to 100
Passing 3/8" sieve, retained on No. 4 sieve.....	21 to 53
Passing No. 4 sieve, retained on No. 10 sieve.....	11 to 32
Total retained on No. 10 sieve.....	54 to 74
Passing No. 10 sieve, retained on No. 40 sieve.....	6 to 32
Passing No. 40 sieve, retained on No. 80 sieve.....	4 to 27
Passing No. 80 sieve, retained on No. 200 sieve.....	3 to 27
Passing No. 200 sieve.....	1 to 8

5. Type "F" - Fine Graded Surface Course

	Percent Aggregate by Weight or Volume
Passing 3/8" sieve.....	100
Passing No. 4 sieve.....	95 to 100
Passing No. 4 sieve, retained on No. 10 sieve.....	58 to 73
Passing No. 10 sieve, retained on No. 40 sieve.....	6 to 26
Passing No. 40 sieve, retained on No. 80 sieve.....	3 to 13
Passing No. 80 sieve, retained on No. 200 sieve.....	2 to 11
Passing No. 200 sieve.....	1 to 8

**2.03 PRIME COAT:**

- A. Prime coat, when specified on the plans, or directed by the ENGINEER, shall be in accordance with Section 02610 - Prime Coat, and as specified herein.
- B. Prime coat shall be applied to the surfaces of bases at least 12 hours prior to placing the HMAC unless otherwise directed by the ENGINEER.
- C. Asphalt prime shall be applied uniformly at the rate in accordance with Section 02610 - Prime Coat.
- D. In order to prevent lapping at the junction of two applications, the distributor shall be promptly shut off. A hand spray shall be used to touch up all spots unavoidably missed by the distributor.
- E. Immediately prior to application of the asphalt prime, an inspection will be made by the ENGINEER to verify that the base course has been constructed as specified. Also, all loose and foreign material shall be removed by light sweeping. Material so removed shall not be mixed with cover aggregate.
- F. The surface to be primed shall be in a smooth and well-compacted condition, true to grade and cross section, and free from ruts and inequalities.
- G. The pressure distributor used for applying prime coat material shall be equipped with pneumatic tires and shall be so designed and operated as to distribute the prime material in a uniform spray without atomization, in the amount and between the limits of temperature specified. It shall be equipped with a speed tachometer registering feet per minute and so located as to be visible to the truck driver to enable him to maintain the constant speed required for application at the specified rate.
- H. The pressure distributor shall be equipped with a tachometer registering the pump speed, pressure gauge, and a volume gauge. The rates of application shall not vary from the rates specified by the ENGINEER by more than 10%. Suitable means for accuracy indicating at all times the temperature of the prime material shall be provided. The thermometer well shall be so placed as not to be in contact with a heating tube.
- I. The distributor shall be so designed that the normal width of application shall be not less than 6 feet, with provisions for the application of lesser width when necessary. If provided with heating attachments, the distributor shall be so

equipped and operated that the prime material shall be circulated or agitated through the entire heating process.

- J. The asphalt prime coat should preferably be entirely absorbed by the base course and, therefore, require no sand cover. If, however, it has not been completely absorbed prior to the start of placing the asphalt concrete mixture and in the meantime it is necessary to permit traffic thereon, sufficient sand shall be spread over the surface to blot up the excess liquid asphalt and prevent it from being picked up by traffic. Also, sand shall be used in areas where traffic may pass over the prime coat. Prior to placing the asphalt concrete, loose or excess sand shall be swept from the base. If a sand cover is specified in the Supplementary Specifications or noted on the plans to cover asphalt prime, it shall be applied within 4 hours after the application of said prime coat, unless otherwise ordered by the ENGINEER.
- K. Liquid asphalt shall be prevented from being sprayed upon adjacent pavements, structures, guard rails, guide posts, culvert markers, trees, and shrubbery that are not to be removed; adjacent property and improvements; other facilities or that portion of the traveled way being used by traffic.
- L. The CONTRACTOR shall protect the prime coat against all damage and markings, both from foot and vehicle traffic. Barricades shall be placed where necessary to protect the prime coat. If, after the prime coat has been applied to the satisfaction of the ENGINEER and has been accepted, if it is disturbed by negligence on the part of the CONTRACTOR, it shall be restored at his expense to its condition at the time of acceptance. No material shall be placed until the prime coat is in a condition satisfactory to the ENGINEER.

#### **2.04 TACK COAT:**

- A. If the asphalt concrete pavement is being constructed directly upon an existing hard-surfaced pavement, a tack coat shall be evenly and uniformly applied to the existing pavement prior to the placing of the new asphalt concrete. The surface shall be free of water, all-foreign material, or dust when the tack coat is applied. No area shall be treated in any one day greater than will be covered by the asphalt concrete during the same day. Traffic will not be permitted over tack coating.
- B. Tack coat for HMAC shall consist of either rapid curing cut-back asphalt RC-2 diluted by addition of (not to exceed 15 percent by volume) an approved grade of gasoline and/or kerosene; emulsified asphalt, EA-11M diluted with 50 percent water, or a cut-back asphalt made by combining 50 to 70 percent of the asphaltic materials specified for the paving mixture with 30 to 50 percent gasoline and/or kerosene by volume.
- C. Tack coat shall conform to the requirements of Section 02620 - Tack Coat, or as specified herein.
- D. Application of tack coat shall be 0.10 to 0.15 gallons per square yard, or as directed by the ENGINEER.

- E. A similar tack coat shall be applied to the surface of any course if, in the opinion of the ENGINEER, the surface is such that a satisfactory bond cannot be obtained between it and the succeeding course.
- F. When required, the contact surfaces of all cold pavement joints, curbs, gutters, manholes, and the like shall be painted with a tack coat immediately before the adjoining asphalt concrete is placed. Asphalt tack coat shall be applied in controlled amounts as shown on the plans or determined by the ENGINEER. Surfaces where a tack coat is required shall be cleaned to the satisfaction of the ENGINEER before the tack coat is applied.

**2.05 MINERAL FILLER:**

- A. Mineral filler, other than hydrated lime, shall consist of a thoroughly dry stone dust, portland cement or other mineral dust approved by the ENGINEER.
- B. The mineral filler shall be free from foreign or other deleterious matter.
- C. When tested by the method outlined in TxDOT Test Method Tex-200-F (Part 1 or 3), mineral filler shall meet the following gradations by weight:

Passing No. 30 Sieve	95-100%
Passing No. 80 Sieve	75%
Passing No. 200 Sieve	55%

**2.06 ANTI-STRIPPING COMPOUND**

- A. Anti-Stripping compound, as required in the job mix formula, shall be furnished in the amounts calculated therein.

**2.07 JOB MIX FORMULA:**

- A. A job mix formula based on representative samples, including filler if required, shall be determined submitted by the CONTRACTOR for approval of the ENGINEER.
- B. The resultant job mix formula shall be within the master range for the specified type of HMAC.
- C. The job mix formula for each mixture shall establish a single percentage of aggregate passing each required sieve size and a single percentage of bituminous material to be added to the aggregate and shall provide for 3 to 5% air voids in the resultant design mix. During the mix design process the following factors will be considered: air voids, Marshall stability, durability, water resistance, and asphalt film thickness.



- D. After the job mix formula is established, mixtures for the project shall conform to the following tolerances which may fall outside of the specified master range:

	Percent by Weight or Volume as Applicable
Passing 1-3/4" sieve, retained on 7/8" sieve	± 5
Passing 7/8" sieve, retained on 5/8" sieve	± 5
Passing 5/8" sieve, retained on 3/8" sieve	± 5
Passing 3/8" sieve, retained on No.4 sieve	± 5
Passing No.4 sieve, retained on No.10 sieve	± 5
Total retained on No.10 sieve	± 5
Passing No.10 sieve, retained on No.40 sieve	± 3
Passing No.40 sieve, retained on No.80 sieve	± 3
Passing No.80 sieve, retained on No.200 sieve	± 3
Passing No.200 sieve	± 3
 Asphaltic Material	 ± 0.05 by wt or 1.2 by vol.
 Mixing Temperature	 ± 20° F

- E. Asphaltic mixture shall be tested in accordance with TxDOT Test Method Tex-200-4 (Part I or Part III) and shall have the following laboratory values:

	Surface Course	Base Course
Density:	Minimum	95%
	Maximum	98%
	Optimum	96.5%
		95%
		99%
		96.5%
Stability (Hveem)		
	Minimum	30%
	Maximum	45%
Stability (Marshall – 75 Blow Briquette)	1500 lbs	1500 lbs.
Voids	3 - 7%	4 - 7%
Voids Filled With Asphalt	75 - 85%	65 - 80%
Sand Equivalent	40	40

**2.08 EQUIPMENT:**

- A. All equipment for the handling of all material, mixing, and placing of HMAC shall be in accordance with the provisions of TxDOT Item 340.

## **2.09 STOCKPILING, STORAGE, PROPORTIONING AND MIXING:**

- A. Stockpiling, storage proportioning and mixing operations shall be in accordance with the Provisions of TxDOT Item 340.

## **PART 3 - EXECUTION**

### **3.01 WEATHER AND TEMPERATURE LIMITATIONS:**

- A. Asphaltic mixture, when placed with a spreading and finishing machine, or the tack coat shall not be placed when the air temperature is 50° F and falling, but may be placed when the air temperature is 40° F and rising.
- B. Asphaltic mixture, when placed with a motor grader, shall not be placed when the air temperature is less than or equal to 60° F and falling, but may be placed when the air temperature is greater than or equal to 50° F and rising.
- C. Mat thicknesses of 1 inch or less shall not be placed when the temperature on which the mat is to be laid is below 50° F.
- D. No tack coat or asphaltic mixture shall be placed when the humidity, general weather conditions and temperature and moisture condition of the base, in the opinion of the ENGINEER, are unsuitable.
- E. If, after being discharged from the mixer and prior to placing, the temperature of the asphaltic mixture is 50° F or more below the temperature established by the ENGINEER, all or any part of the load may be rejected and payment will not be made for the rejected material.

### **3.02 EQUIPMENT:**

#### **A. Hauling Equipment:**

- 1. Trucks used for hauling asphaltic mixtures shall have tight, clean, smooth metal beds that have been thinly coated with a minimal amount of paraffin oil, lime slurry, tine solution or other approved material to prevent mixture adhesion to the bed.
- 2. The dispatching of hauling equipment shall be arranged so that all material delivered may be placed and all rolling completed during daylight hours, unless otherwise directed by the ENGINEER.
- 3. All trucks shall be equipped with a cover of canvas, or other suitable material to protect the mixture from weather or on hauls where the temperature of the mixture will fall below specified level. Use of covers will be as directed by the ENGINEER.

#### **B. Rollers:**

- 1. Pneumatic Tire Roller. This roller shall consist of not less than seven pneumatic tire wheels, running on axles in such manner that the rear group

of tires shall cover the entire gap between adjacent tires of the forward group; mounted in a rigid frame; and provided with a loading platform or body suitable for ballast loading. The front axle shall be attached to the frame in such manner that the roller may be turned within a minimum circle. The tire shall provide surface contact pressures up to 90 pounds per square inch or more. The roller shall be so constructed as to operate in both a forward and a reverse direction with suitable provisions for moistening the surface of the tires while operating; and shall be approved by the ENGINEER. It shall be operated in accordance with the manufacturer's recommendations.

2. Two Axle Tandem Roller. This roller shall be an acceptable power-driven, steel-wheel, tandem roller weighing not less than eight tons. It must operate in forward and reverse directions; contain provision for moistening the surface of the wheels while in motion; and shall be approved by the ENGINEER. It shall be operated in accordance with the manufacturer's recommendations.
3. Three Wheel Roller. This roller shall be an acceptable power-driven, all steel, three wheel roller weighing not less than 10 tons. It must operate in forward and reverse directions; contain provisions for moistening the surface of the wheel while in motion; and shall be approved by the ENGINEER. It shall be operated in accordance with the manufacturer's recommendations.
4. Vibratory Steel Wheel Roller. If approved for use by the OWNER, this roller shall have a minimum weight of six tons. The compactor shall be equipped with amplitude and frequency controls and shall be specifically designed to compact the material on which it is used. It shall be operated in accordance with the manufacturer's recommendations.

C. Straight Edges:

1. The CONTRACTOR shall provide an acceptable 16-foot straight-edge for surface testing. Satisfactory templates shall be provided as required by the ENGINEER.

D. Spreading and Finishing Machine:

1. Bituminous pavers shall be self-contained, power-propelled units, provided with an activated screed or a strike-off assembly, heated if necessary, and capable of spreading and finishing courses of bituminous plant mix material in lane widths applicable to the specified typical section and thickness shown on the plans.
2. The paver shall be equipped with a receiving hopper having sufficient capacity for a uniform spreading operation. The hopper shall be equipped with a distribution system to place the mixture uniformly in front of the screed. Design will be such that no part of the truck weight will be supported by the paver.

3. The screed or strike-off assembly shall effectively produce a finished surface of the required evenness and texture without tearing, shoving or gouging the mixture. When laying mixtures, the paver shall be capable of being operated at forward speeds consistent with satisfactory laying of the mixture. The screed shall be adjustable for both height and crown and shall be equipped with a controlled heating device.
4. The bituminous paver shall be equipped with an automatic leveling device controlled from an external guide. The initial pass for each course shall be made using a paver equipped with a 40-foot minimum external reference, except that these requirements will not apply when asphalt concrete is placed adjacent to portland cement concrete pavement. Subsequent passes may utilize the matching device of one foot minimum length riding on the adjacent lay.

### **3.03 CONSTRUCTION METHODS:**

#### **A. Spreading and Finishing:**

1. The asphalt concrete mixture shall be laid on the approved surface, spread and struck off to the grade and elevation established. It shall be spread and compacted in layers as shown on the plans or as directed by the ENGINEER. Bituminous pavers shall be used to distribute the mixture either over the entire width or over such partial width as may be practicable.
2. The ENGINEER will determine a minimum placement temperature within a range from 220° F to 300° F which will produce the required density. The established placement temperature, which is measured immediately behind the laydown machine, shall not vary more than 20° F.
3. A conventional paver or suitable equipment approved by the ENGINEER may be used to place asphalt concrete material on shoulders depressed from the traveled lanes in order to establish a uniform typical section. Approval of the equipment used will be based upon the results obtained.
4. The asphalt concrete may be dumped from the hauling vehicles directly into the paving machine or it may be dumped upon the surface being paved and subsequently loaded into the paving machine; however, no asphaltic concrete shall be dumped from the hauling vehicles at a distance greater than 250 feet in front of the paving machine. When asphaltic concrete is dumped first upon the surface being paved, the loading equipment shall be self-supporting and shall not exert any vertical load on the paving machine. Substantially all of the asphaltic concrete dumped shall be picked up and loaded into the paving machine.
5. To achieve, as far as practicable, a continuous operation, the speed of the paving machine shall be coordinated with the production of the plant. Sufficient hauling equipment shall be available to insure continuous operation.
6. The control system shall control the elevation of the screed at each end by controlling the elevation of one end directly and the other indirectly either

through controlling the transverse slope or alternately when directed, by controlling the elevation of each end independently, including any screed attachment used for widening, etc. Failure of the control system to function properly shall be cause for the suspension of the asphaltic concrete operations.

7. When dumping directly into the paving machine from trucks, care shall be taken to avoid jarring the machine or moving it out of alignment.
8. All courses of asphaltic concrete shall be placed and finished by means of self-propelled paving machines except under certain conditions or at certain locations where the ENGINEER deems the use of self-propelled, paving machines impracticable.
9. Self-propelled paving machines shall spread the asphaltic concrete without segregation or tearing within the specified tolerances, true to the line, grade, and crown indicated on the plans. Pavers shall be equipped with hoppers and augers which will place the asphaltic concrete evenly in front of adjustable screeds without segregation. Screeds shall include any strike-off device operated by tamping or vibrating action which is effective without tearing, shoving or gouging the asphaltic concrete and which produces a finished surface of an even and uniform texture for the full width being paved. Screeds shall be adjustable as to height and crown and shall be equipped with a controlled heating device for use when required.
10. On areas where irregularities or unavoidable obstacles make the use of mechanical spreading and finishing equipment impracticable, the mixture shall be spread, raked, fluted and compacted with hand tools. For such areas the mixture shall be dumped, spread and screed to give the required compacted thickness.

B. Compaction:

1. Rolling with the 3-wheel and tandem roller shall start longitudinally at the sides and proceed toward the center of the surface course, overlapping on successive trips by at least half the width of the rear wheels.
2. Alternate trips of the roller shall be slightly different in length.
3. Rolling with a pneumatic tired roller shall be as directed by the ENGINEER.
4. Rolling shall continue with no further compression can be obtained and all roller marks are eliminated.
5. The motion of the roller shall be slow enough at all times to avoid displacement of asphaltic materials. If displacement occurs, it shall be corrected immediately by use of rakes and fresh asphaltic mixtures, where required.
6. The roller shall not be allowed to stand on the surface course when it has not been fully compacted and allowed to cool.

7. To prevent adhesion of the surface course to the roller, the wheels shall be kept thoroughly moistened with water; however, excess water shall not be allowed.
8. All precautions shall be taken to prevent dripping of gasoline, oil, grease, or other foreign substances on the surface or base courses during rolling operations or while rollers are standing.
9. With the approval of the ENGINEER, a vibratory steel wheeled roller may be substituted for the 3-wheel roller and tandem roller.
10. Along forms, curbs, headers, walls and other places not accessible to the rollers, the mixture shall be thoroughly compacted with hot hand tampers, smoothing irons, or with mechanical tampers. On depressed areas, a trench roller may be used or cleated compression strips may be used under the roller to transmit compression to the depressed area.
11. Any mixture that becomes loose, broken, mixed with dirt, segregated, or is in any way defective shall be removed and replaced with fresh hot bituminous mixture, which shall be compacted to conform with the surrounding area. Any area showing excess or deficiency of bituminous material shall be corrected immediately as directed by the ENGINEER.

C. In-Place Density:

1. In-place density shall be required for all mixtures except thin irregular depth leveling courses.
2. Each course, after final compaction, shall have a density of not less than 95 percent of the density developed in the laboratory test method outlined in TxDOT Bulletin C-14.
3. Density shall be determined with a portable nuclear test device in conformity with ASTM D-2950.76.
4. Calibration of the portable nuclear device will be established by the ENGINEER from cut pavement samples tested in accordance with AASHTO T-166 (weight, volume method). The density readings of the cut pavement samples determined in accordance with AASHTO T-166 (weight, volume method), and the density readings of the pavement samples determined by the portable nuclear test device in conformity with ASTM D 2950 will be correlated by the ENGINEER.
5. Other methods of determining in-place density may be used as deemed necessary by the ENGINEER.
6. It is intended that acceptance density testing will be done while the bituminous mixture is hot enough to permit further compaction if necessary. If the density of an acceptance section does not meet the specified requirements, the CONTRACTOR shall continue the compaction effort until the optimum density is obtained. Rolling for any compactive effort will not be allowed when the temperature of the mix is below 175° F unless authorized in

writing by the ENGINEER. Rerolling the paved surface after it has initially cooled will not be allowed.

7. If in-place density tests of the mixture produce a value lower than specified and in the opinion of the ENGINEER is not due to a change in the quality of the material, production may proceed with subsequent changes in the mix and/or construction procedures until in-place density equals or exceeds the specified density.
8. In-place density tests will be provided by the ENGINEER unless otherwise specified.

D. Joints:

1. Placing of the asphalt concrete shall be as continuous as possible. Rollers shall not pass over the unprotected end of a freshly laid mixture unless authorized by the ENGINEER.
2. When plant mix bituminous pavement is placed over plant mix bituminous treated base or when plant mixed seal coat is placed over plant mix bituminous pavement, longitudinal joints shall be staggered at least 6 inches with relation to the longitudinal joints of the underlying course.
3. Transverse joints shall have a two foot or 12:1 minimum taper. Longitudinal joints shall have a one foot or 6:1 minimum taper. All transverse tapers shall be cut and squared off prior to commencing new work. Tapered longitudinal joints from previous operations shall be cleaned and tack coated if directed by the ENGINEER. All joints shall be completely bonded. The surface of each course at all joints shall be smooth and shall not show any deviations in excess of 3/16 of an inch when tested with a 10-foot straightedge in any direction.
4. When paving under traffic, the CONTRACTOR shall plan his daily surfacing operations on a schedule which will result in not more than one (1) day's operation of exposed longitudinal joints. The longitudinal joints shall not have a height greater than two (2) inches and shall not be left exposed longer than 24 hours.

E. Surface Tolerance:

1. Upon completion, the pavement shall be true to grade and cross section. Except at intersections or any changes of grade, when a 16 foot straight edge is laid on the finished surface parallel to the centerline of the roadway, the surface shall not vary from the edge of the straight edge more than 1/16-inch per foot. Areas that are not within this tolerance shall be brought to grade immediately following the initial rolling. After the completion of final rolling, the smoothness of the course shall be checked, and the irregularities that exceed the specified tolerances or that retain any water on the surface shall be corrected by removing the defective work and replacing with new material as directed by the ENGINEER at the expense of the CONTRACTOR.

F. Manholes and Valve Covers:

1. Manhole frames and valve covers shall be adjusted prior to placing the surface course.

G. Compacted Thickness of HMAC Surface and Base Courses:

1. Surface Courses. The compacted thickness or depth of the asphaltic concrete surface course shall be as shown on the plans. Where the plans require a depth or thickness of the surface course greater than two inches compacted depth, same shall be placed in multiple courses of equal depth, each of which shall not exceed two inches compacted depth. If, in the opinion of the ENGINEER, an additional tack coat is considered necessary between any of the multiple courses, it shall be applied at the rate as directed.
2. Base Courses. The compacted thickness or depth of each base course shall be as shown on the plans. Where the plans require a depth or thickness of the course greater than 4 inches, same shall be accomplished by constructing multiple lifts of approximately equal depth, each of which shall not exceed these maximum compacted depths. If, in the opinion of the ENGINEER, an additional tack coat is considered necessary between any of the multiple lifts, it shall be applied as hereinbefore specified and at the rate as directed.

H. Pavement Thickness Tests:

1. Pavement Thickness Test. Upon completion of the work and before final acceptance and final payment shall be made, pavement thickness test shall be made by the ENGINEER or his authorized representative unless otherwise specified in the special provisions or in the plans. The number and location of tests shall be at the discretion of the OWNER. The cost for the initial pavement thickness test shall be at the expense of the ENGINEER. In the event a deficiency in the thickness of pavement is revealed during normal testing operations, subsequent tests necessary to isolate the deficiency shall be at the CONTRACTOR's expense.

I. Price Adjustment for Roadway Density

1. The payment of the unit price will be adjusted for roadway density as outlined in the following table. The adjustment will be applied on a lot by lot basis for each lift. The adjustment will be based on the average of five density tests. The price adjustment will be applied to the entire asphalt concrete mix which includes the HMAC aggregate, the asphalt cement and anti-stripping compound, if used.



Average Density % of Lab Density	Percent of Contract Price To Be Paid
Above 95%	100%
94.0 to 94.99	96%
93.0 to 93.99	91%
92.0 to 92.99	85%
Less than 92.00	*

\* This lot shall be removed and replaced to meet specification requirements as ordered by the ENGINEER. In lieu thereof, the CONTRACTOR and the ENGINEER may agree in writing that for practical purposes, the lot shall not be removed and will be paid for at 50% of the contract price.

#### **PART 4 - MEASUREMENT AND PAYMENT**

##### **4.01 INCIDENTAL WORK:**

- A. Prime coat, anti-stripping compound, where used, and tack coat shall not be measured for direct payment, but shall be considered as subsidiary work pertaining to the placing of asphaltic mixtures of the contract price.

##### **4.02 MEASUREMENT:**

- A. Hot-mix asphalt concrete material shall be measured by the ton of 2,000 pounds or by the square yard of the type or types used in the completed and accepted work, as shown on the Bid Proposal.
- B. Weight shall be determined by a certified scale approved by the OWNER and recorded serially numbered weight tickets, identifying the vehicle and presented to the ENGINEER's representative on the job.

##### **4.03 PAYMENT:**

- A. Work performed and materials furnished, as prescribed by this item, measured as provided herein, shall be paid at the unit bid price per ton or square yard for the type or types of hot mix asphalt concrete pavement shown on the proposal.
- B. Unit bid price shall be payment in full for quarrying; furnishing all materials; for all heating; mixing; hauling; cleaning existing base course or pavement; placing asphaltic mixtures; rolling and finishing; and for all labor, tools, equipment and incidentals necessary to complete the work, including the work and materials involved in the application of prime coat and tack coat.

**\*\*\* END OF SECTION \*\*\***

# APPENDIX "A"

## SPECIFICATIONS FOR VALLE ALTO PARK CONCESSION



SEP 10 2018

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**DIVISION 1 GENERAL REQUIREMENTS**  
**01040 PROJECT COORDINATION**

**PART 1 – GENERAL**

**1.1 SUMMARY**

- A. This section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
  - 1. Coordination Drawings
  - 2. Administrative and supervisory personnel
  - 3. Project Meetings
  - 4. Requests for Interpretation (RFI's)
- B. Each contractor shall participate in coordination requirements. Certain areas of responsibility will be assigned to a specific contractor.

**1.2 DEFINITIONS**

- A. RFI: Request from contractor seeking interpretation or clarification of the Contract Documents.

**1.3 COORDINATION:**

- A. Coordinate various elements of the work and entities engaged to perform work; and coordinate the work with existing facilities/conditions, and with work by separate contractors (if any) and by Owner.
- B. Coordinate Contractor's Construction Schedule with the Schedule of Values, list of subcontractors, Submittals Schedule, progress reports, payment requests and other required schedules and reports.
  - 1. Secure time commitments for performing critical elements of the Work from parties involved.
  - 2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

**PART 2 PRODUCTS – Not Used**

**PART 3 EXECUTION**

**3.1 INSTALLATION:**

- A. Comply with manufacturer's installation instructions and recommendations to the extent that printed information is more detailing or stringent than requirements contained directly in contact documents.

**3.2 CLEANING AND PROTECTION:**

- A. Clean each element of the work at the time of installation. Provide sufficient maintenance and protection during construction to ensure freedom from damage and deterioration at time of substantial completion.
- B. The contractor shall maintain areas free from hazardous or obstructive rubbish and debris,

due to performance of the general work, during construction. All rubbish shall be confined to the project and not allowed to contaminate adjacent properties. The work shall be continuously cleaned. Refuse and debris to be placed in containers provided by the Contractor for removal not less than weekly and more often as required for cleanliness.

- C. When the electrical systems have been installed, the contractor shall remove all rubbish and debris from the building site, remove all paint, plaster and accumulated dirt from all equipment, fixtures, and piping. At completion of the project, the project shall be cleaned and dusted and all glass surfaces polished clean. All the Contractor's tools construction equipment, machinery, and surplus materials shall be removed from the project site. Entire project site shall be raked with all debris 3/4" dia. or larger removed and hauled to approved landfill.

### 3.3 ACCESS:

- A. The Contractor shall provide latrines for use of his employees. Contractor's employees will not be allowed to use building facilities.

### 3.4 SAFETY:

- A. The contractor shall note that the Owner will assume no responsibility for the safety of the Contractor's employees. THE SAFETY OF THE CONTRACTOR'S EMPLOYEES IS SOLELY THE RESPONSIBILITY OF THE CONTRACTOR.
- B. The Contractor shall also cordon off areas with equipment, traffic, etc. for the general safety of the public and Owners.

### 3.5 PROTECTION:

- A. The Contractor shall provide such temporary walks, fences, or other protective structures as are necessary or required for public safety, provide sufficient night guards adjacent to all obstructions during darkness which may be necessary. Protection of the work and safety precautions are the total responsibility of the General Contractor.

### 3.6 SECURITY:

- A. The Contractor shall assume full responsibility for protection and safekeeping of materials and/or equipment stored on premises.

END OF SECTION

**DIVISION 1 GENERAL REQUIREMENTS**  
**01045 CUTTING AND PATCHING**

PART 1 – GENERAL

1.1 RELATED DOCUMENTS:

- A. Drawings and general provisions of the Contract, include General and Supplementary Conditions and other Division-1 Specification sections, apply to this section.

1.2 SUMMARY:

- A. This Section specifies administrative and procedural requirements for cutting and patching.

1.3 DEFINITIONS

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

1.4 QUALITY ASSURANCE

- A. STRUCTURAL WORK: Do not cut and patch structural elements in a manner that would reduce their load-carrying capacity or load-deflection ratio.
- B. Obtain approval of the cutting and patching proposal before cutting and patching but, not limited to the following structural elements:
  - 1. Timber and primary wood framing.
  - 2. Species const. specified div. 13
  - 3. Foundation construction
  - 4. Structural decking
  - 5. Bearing and retaining walls
  - 6. Stair systems
  - 7. Structural concrete
  - 8. Miscellaneous structural metals
  - 9. Structural steel
  - 10. Exterior curtain wall construction
  - 11. Lintels
  - 12. Equipment supports
  - 13. Piping, ductwork, vessels and equipment
- C. Miscellaneous Elements: Do not cut and patch miscellaneous elements or related components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety. Miscellaneous elements include the following:
  - 1. Water, moisture or vapor barriers.
  - 2. Membranes and flashings
  - 3. Equipment supports
  - 4. Piping, ductwork, vessels, and equipment
  - 5. Noise and vibration-control elements and systems.

- D. Visual Requirements: Do not cut and patch construction exposed on the exterior or in occupied spaces, in a manner that would, in the Architect's opinion, reduce the building's aesthetic qualities, or result in visual evidence of cutting and patching. Remove and replace cut and patched in a visually unsatisfactory manner.
- E. Cutting and Patching Proposal: Where approval of procedures for cutting and patching is required, submit a proposal describing procedures well in advance of the time cutting and patching will be performed and request approval to proceed. Include the following information, as applicable, in the proposal.
  - 1. Describe the extent of cutting and patching required and how it is to be performed; indicate why it cannot be avoided.
  - 2. Describe anticipated results in terms of changes to existing construction; include change to structural elements and operating components as well as changes in the building's appearance and other significant visual elements.
  - 3. List products to be used and firms or entities that will perform work.
  - 4. Indicate dates when cutting and patching is to be performed.
  - 5. List utilities that will be disturbed or affected, include those that will be relocated and those that will be temporarily out of service. Indicate how long service will be disturbed.
  - 6. Where cutting and patching involves addition of reinforcement to structural elements, submit details and engineering calculations to show how reinforcement is integrated with the original structure.

## PART 2 - PRODUCTS:

### 2.1 MATERIALS: Use materials that are identical to existing materials.

- A. If identical materials are not available or cannot be used where exposed surfaces are involved, use materials that match existing adjacent surfaces to the fullest extent possible with regard to visual effect. Use materials whose installed performance will equal or surpass that of existing materials.

## PART 3 – EXECUTION

### 3.1 INSPECTION

- A. Before cutting existing surfaces, examine surfaces to be cut and patched and conditions under which cutting and patching is to be performed. Take corrective action before proceeding if unsafe or unsatisfactory conditions are encountered.
- B. Before proceeding, meet at the site with parties involved in cutting and patching, include mechanical and electrical trades. Review areas of potential interference and conflict before proceeding.

### 3.2 PREPARATION

- A. Temporary Support: Provide temporary support of Work to be cut.
- B. Protection: Protect in-place constructions during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- C. Adjoining Areas: Avoid interference with use of adjoining areas or interruption of free

passage to adjoining areas.

- D. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated or abandoned, bypass such services/systems before cutting to prevent interruption to occupied areas.

### 3.3 PERFORMANCE

- A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
- B. CUTTING: Cut existing construction using methods least likely to damage elements to be retained or adjoining construction. Where possible review proposed procedures with the original installer; comply with the original installer's recommendations.
  - 1. In general, where cutting is required, use hand or small power tools designed for sawing or grinding, not hammering and chopping. Cut holes and slots neatly to size required with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
- C. PATCHING: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as possible. Comply with specified tolerances.
  - 1. Inspection: Where feasible, inspect and test patched areas to demonstrate integrity of the installation.
  - 2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
    - a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
    - b. Restore damaged pipe covering to its original conditions.
  - 3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaced in the new space. Provide an even surface of uniform finish, color, texture and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
    - a. Where patching occurs in a painted surface, apply primer and intermediate paint coats over the patch and apply final coat over entire unbroken surface containing the patch. Provide additional coats until the patch blends with adjacent surfaces.
  - 4. Ceilings: Patch, repair or rehang existing ceilings as necessary to provide an even plane surface of uniform appearance.
  - 5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weather-tight condition.
- D. CLEANING: Thoroughly clean areas and spaces where cutting and patching is performed or use as access. Remove paint, mortar, oils, putty and items of similar nature completely. Thoroughly clean piping, conduit and similar features before painting or other finishing is applied. Restore damaged pipe covering to its original condition.

END OF SECTION



**DIVISION 1 GENERAL REQUIREMENTS**  
**01090 ALTERATIONS**

PART 1 GENERAL

1.1 SUMMARY

- A. The procedures and administrative requirements of this Section apply to all of the following Sections of the specifications which are involved in alterations to the existing building.

1.2 EXTENT NOTES

- A. Cut into or partially remove portions of the existing building as necessary to make way for new construction. Include such work as:
1. Cutting, moving, or removal of items shown to be cut, moved or removed.
  2. Cutting, moving, or removal of items not shown to be cut, move or removed, but which must be cut, moved or removed to allow new work to proceed. Work or items which are to remain in the finished work shall be patched or reinstalled after their cutting, moving or removal, and their joints and finishes made to match adjacent or similar work.
  3. Removal of existing surface finishes as needed to install new work and finishes.
  4. Removal of abandoned items and removal of items serving no useful purpose, such as abandoned piping or wiring.
  5. Repair or removal of dangerous or unsanitary conditions.
  6. Removal of unsuitable or extraneous materials not marked for salvage, such as abandoned furnishings, debris, and rotted wood.

1.3 SCHEDULING AND ACCESS

- A. **OUTAGES:** Utility and service outages shall be kept to a minimum, and will be permitted only with permission from Owner.
- B. **SECURITY:** When keys for locked areas are need to perform work, obtain from Owner. Return keys at end of each day's work.
- C. **ACCESS BY OWNER:** The Owner shall have access to the building at all times during adjacent work.

PART 2 PRODUCTS – Not Used

PART 3 EXECUTION

3.1 ALTERATIONS, CUTTING AND PROTECTION

- A. **EXTENT:** Cutting and removal work shall be performed so as not to damage adjacent work.
- B. **RESPONSIBILITY AND ASSIGNMENT TO TRADES:** Contractor shall assign the work of moving, removal, cutting, patching and repair to trades under his supervision so as to cause the least damage to each type of work encountered, and so as to return the building as much as possible to the appearance of new work.

1. Patching of finish materials shall be assigned to mechanics skilled in the work of the finish trade involved.
- C. PROTECTION: Protect remaining finishes, equipment, and adjacent work from damage caused by cutting, moving, removal and patching operations. Protect surfaces which will remain a part of the finished work.
- D. DISCOVERIES: Construction, furnishings, and articles of a historic or private nature, which are encountered during cutting, removal and new construction, shall be turned over to the Owner, or if the Owner desires for the disposition shall be sought and followed.
- E. SALVAGE:
1. Salvage sufficient quantities of cut or removed material to replace damaged work or patch new work, where the material cannot be readily obtained in today's market.
  2. In addition to items specified above or indicated on the drawings to be salvaged, items marked or listed for salvage shall remain the property of the Owner and shall be carefully removed and store in a dry, secure place.
  3. Do not incorporate salvaged or used materials in new construction, except for small quantities of finish material which are difficult to match.
- F. DEBRIS: Remove debris promptly from the site each day. Removed material becomes the property of the Contractor. Load removed material directly onto trucks for removal from site. Dispose of removed material legally. Do not burn material on site and do not allow debris to enter sewers.

### 3.2 PATCHING, EXTENDING, AND MATCHING:

- A. SKILL: Patch and extend existing work using skilled mechanics who are capable of matching the existing quality of workmanship. The quality of patched work or extended work shall not be less than specified in Sections of the product and execution Specifications which follow these General Requirements.
- B. PATCHING:
1. In areas where any portion of an existing finished surface is damaged, lifted, stained or other wise made imperfect by work of this contract, patch or replace the imperfect portion of the surface with matching material.
  2. Provide adequate support or substrate for patching of finishes.
  3. If the imperfect surface was a painted or coated one, repaint or recoat the patched portion in such a way that uniform color and texture over the entire surface results.
  4. If the surrounding surface cannot be matched, repaint or recoat the entire surface.

### 3.3 QUALITY

- A. In the Sections of the product and execution specifications which follow these General Requirements, no concerted attempt has been made to describe each of the various existing products that must be used to patch, match, extend or replace existing work. Obtain all such products in time to complete the Work on Schedule. Such products shall be provided in quality which is in no way inferior to the existing products.
- B. The quality of the products that exist in the building, as apparent during pre-bid site visits, shall serve as the Specifications requirement for strength, appearance, and other characteristics.

### 3.4 TRANSITIONS

- A. Where new work abuts or finishes flush with existing work, make the transition as smooth and workmanlike as possible. Patched work shall match existing adjacent work in texture and appearance as to make the patch or transition invisible to the eye at a distance of 3 ft.
- B. Where masonry, tile, plaster, metal or other finished surface is cut in such a way that a smooth transition with new work is not possible, terminate the existing surface in a neat fashion along a straight line at a natural line of division and provide trim appropriate to the finished surface.

### 3.5 MATCHING

- A. Restore existing work that is damaged during construction to a condition equal to its condition at the time of the start of the Work.
- B. At location in existing areas where partitions are removed, patch the floors, walls, and ceiling with finish materials to match adjacent finishes.

### 3.6 OVERALL REQUIREMENTS THAT THE WORK BE COMPLETED

- A. Where a product or type of construction occurs in the existing building, and it is not specified as a part of the new work, provide such products or types of construction as needed to patch, extend or match the existing work.
- B. These Specifications will generally not describe existing products or standards of execution, nor will they enumerate products which are not a part of the new construction. The existing product is its own Specification.
- C. The presence of any product or type of construction in the old work shall cause its patching, extending, or matching to be performed, as necessary to make the work complete and consistent, to identical standards of quality.

### 3.7 REPAIR

- A. Replace work damaged in the course of alterations, except at areas approved for repair.
- B. Where full removal of extensive amounts of almost-suitable work would be needed to replace damaged portions, then filling, spackling, straightening, and similar repair techniques, followed by full painting or other finishing, will be permitted.
- C. Examples of work that will frequently be approved for repair rather than replacement: pitting and concealed concrete surfaces, slightly bent ceiling runners, hairline cracks in plaster.
- D. If the repaired work is not brought up to standard of new work, it shall be cut out and replaced with new work.

### 3.8 CLEANING:

- A. EACH SUCCESSIVE TRADE: As each trade finishes its work on each part of the alteration work and related new work, it shall clean up its work area and make work surfaces ready for work of the succeeding trades.

- B. Spillage, overspray, collections of dust or debris, and damage to Owner occupied spaces shall be cleaned or remedied immediately by the responsible trade.
- C. EACH AREA AS IT IS COMPLETED: Clean up all surfaces, remove equipment, salvage and debris, and return in condition suitable for use by the Owner as quickly as possible.

END OF SECTION

**DIVISION 1 GENERAL REQUIREMENTS**  
**01311 SCHEDULE AND PAYMENTS**

PART 1 - GENERAL

1.1 PROGRESS REPORT

- A. Provide reports at the end of each week to record progress and problems.

1.2 SCHEDULE OF VALUES

- A. General: Each prime contractor shall prepare a schedule of values, as required by the General Conditions, in conjunction with the preparation of the progress schedule.
- B. Coordinate preparation of the Schedule of Values with the preparation of the progress schedule.
  - 1. Correlate line items with other administrative schedules and forms required for the work, including the progress schedule, payment request form, listing of products and principal suppliers and fabricators and the schedule of submittals.
  - 2. Provide breakdown of the Contract Sum Value of the items, and the percentage of the Contract Sum to nearest one-hundredth percent and adjust to total 100 percent.

1.3 PAYMENT REQUEST

- A. General: Except as otherwise indicated, the progress payment cycle for each prime Contractor is to be regular.
  - 1. Each application must be consistent with previous applications and payments.
  - 2. Certain applications for payment, such as the initial application, the application at substantial completion, and the final payment application involve additional requirements.

1.4 WAIVE OF LIEN

- A. For each payment application, each prime contractor shall submit waivers of lien for each entity, (including Contractor) who could lawfully and possibly file a lien in excess of \$100.00 arising out of the Contractor, and related to work covered by the payment.
- B. Submit partial waivers for the amount requested, prior to deduction of retainage, on each item. When the application shows completion of an item, submit final or full waivers.
- C. The Owner reserves the right to designate which entities involved in the work must submit waivers.

1.5 WAIVER FORMS

- A. Submit waivers on forms, and execute in a manner, acceptable to Owner.

1.6 PAYMENT APPLICATION TIMES

- A. The "date of each progress payment" for each prime Contractor is as indicated in Owner-Contractor Agreement or, if none is indicated therein, it is the 25th day of each month.
- B. The period of construction work covered by each payment request is period indicated in Owner-Contractor Agreement or, if none is indicated therein, it is period ending 15 days

prior to date for each progress payment, and period starts on day following end of preceding period.

## 1.7 PAYMENT APPLICATION FORMS

- A. AIA Document G702 and Continuation Sheets; available from "Publications, a Division of The AIA Service Corporation", 1735 New York Ave., N. W., Washington, D. C. 20006 (also available at most local AIA chapter offices).
- B. APPLICATION PREPARATION: Except as otherwise indicated, complete every entry provided for on the form, including notarization and execution by authorized persons. Incomplete applications will be returned by the Architect without action. Entries must match current data of schedule of values, progress schedule and reports. Listing must include amounts on change orders issued prior to last day of the "period of construction" covered by application.
- C. INITIAL PAYMENT APPLICATION: The principal administrative actions and submittals which must precede or coincide with submittal of each prime contractor's first payment application can be summarized as follows, but not necessarily by way of limitation:
  - 1. Listing of subcontractors and principal suppliers and fabricators.
  - 2. Schedule of principal products.
  - 3. Schedule of submittals (preliminary if not final).
  - 4. Listing of Contractor's staff assignments and principal consultants.
  - 5. Copies of acquired building permits and similar authorizations and licenses from governing authorities for current performances of the work.
  - 6. Performance and/or payment bond (if required).
  - 7. Evidence satisfactory to Owner that Contractor's insurance converges have been secured.
  - 8. Data needed by Owner to secure related insurance coverage.
  - 9. Initial progress report, including report of pre-construction meeting.
- D. APPLICATION AT TIME OF SUBSTANTIAL COMPLETION: Following issuance of Architect's final "certificate of substantial completion" on each prime contractor's work, and also in part as applicable to prior certificates on portions of completed work as designated, a "special" payment application actions and submittal which must precede or coincide with such special applications can be summarized as follows, but not necessarily by way of limitations.
  - 1. Occupance permits and similar approvals or certificates by governing authorities and franchised services, assuring Owner's full access and use of completed work.
  - 2. Warranties (guarantees), maintenance agreements and similar provisions of contract documents.
  - 3. Final cleaning of the work.
  - 4. Listing of Contractors' incomplete work, recognized as exceptions to Architect's certificate of substantial completion.
- E. FINAL PAYMENT APPLICATION: The administrative actions and submittal which must precede or coincide with submittal of each prime contractor's final payment applications can be summarized as follows, but not necessarily by way of limitation:
  - 1. Completion of project closeout requirements.
  - 2. Completion of items specified for completion beyond time of substantial completion (regardless of whether special payment application was previously made).
  - 3. Assurance, satisfactory to Owner, that unsettled claims will be settled and that work not actually completed and accepted will be completed without undue delay.

4. Transmittal of required project construction records to Owner.
  5. Certified property survey (Contractor for General Work).
  6. Proof, satisfactory to Owner, that taxes, fees, and similar obligations of Contractor have been paid.
  7. Removal of temporary facilities, services, surplus materials, rubbish and similar elements.
  8. Consent of surety for final payment.
- F. APPLICATION TRANSMITTAL: Each prime contractor shall submit 3 executed copies of each payment, applications, one copy of which shall be complete with waivers of lien and similar attachments. Transmit each copy with transmittal form listing those attachments, and recording appropriate information related to application in a manner acceptable to Architect. Transmit to Architect by means ensuring receipt within 24 hours.

END OF SECTION

**DIVISION 1 GENERAL REQUIREMENTS**  
**01340 SHOP DRAWINGS AND DATA AND SAMPLES**

**PART 1 – GENERAL**

**1.1 SUMMARY:**

- A. This section includes administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.
- B. Submit to Architect / Engineer, Shop Drawings, Product Data and Samples required by Specification Section.
- C. Prepare and submit, with Construction Schedule, a separate schedule listing dates for submission and review of Shop Drawings. Products Data and Samples will be needed for each product.

**1.2 SHOP DRAWINGS:**

- A. Original drawings, prepared by Contractor, Subcontractor, supplier or Distributor, which illustrate some portion of the work; showing fabrication, layout, setting or erection details. No portion of the Contract Documents shall be reproduced for use as a part of the Shop Drawings.
- B. Shop drawings shall be prepared by a qualified detailer.

**1.3 SUBMISSION REQUIREMENTS:**

- A. Schedule submissions at least two weeks before reviewed submittals will be needed.
- B. Shop Drawings: Submit number of copies or Product Data which contractor requires for distribution plus two (2) copies which will be retained by Architect/Engineer. (Eight (8) copies total)
- C. Product Data: Submit number of copies or Product Data which Contractor requires for distribution plus three (3) copies which will be retained by Architect/Engineer. (Eight (8) copies total)
- D. Samples: Submit number of samples specified in each Specification Section.
- E. Accompany submittals with transmittal letter in duplicate, containing:
  - 1. For work designed by consultants, make submission directly to consultant and simultaneously submit duplicate of transmittal letter to Architect.
- F. Submittals shall include:
  - 1. Date and Revision Dates
  - 2. Project Title and Number
  - 3. The Names of:
    - a. Architect/Engineer
    - b. Contractor
    - c. Subcontractor
    - d. Supplier
    - e. Manufacturer
    - f. Separate detailer when pertinent
  - 4. Contractor's stamp, initialed or signed, certifying review of submittal verification of field measurements and compliance with Contract Documents.
  - 5. Identification of product materials
  - 6. Field dimension, clearly identified as such
  - 7. Applicable standards, such as ASTM or Fed. specification
  - 8. Identification of deviations
- H. If shop drawings which have been previously submitted for review are resubmitted, they



shall clearly note any changes or additions that have been made to the previous submittal.

#### 1.4 RESUBMISSION REQUIREMENTS:

- A. Shop Drawings:
  - a. Revise initial drawings as required and resubmit as specified for initial submittal.
  - b. Indicate on drawings any changes which have been made other than those requested by the Architect/ Engineer.
- B. Product data and Samples: Submit new data and samples as required for initial submittal.

### PART 2 – PRODUCTS

#### 2.1 PRODUCT DATA: Collect information into a single submittal for each element of construction and type of product or equipment

- A. Manufacturer's Standard Schematic Drawings:
  - 1. Modify drawings to delete information not applicable to project.
- B. Manufacturer's Catalog Sheets, Brochures, Diagrams, Schedules, Performance Charts, Illustrations and other descriptive data.
  - 1. Clearly mark each copy to identify pertinent materials, products or models.
  - 2. Manufacturer's written recommendations
  - 3. Manufacturer's product specifications
  - 4. Manufacturer's installation instructions
  - 5. Standard color charts
  - 6. Manufacturer's catalog cuts
  - 7. Standard product operation and maintenance manuals
  - 8. Wiring diagrams showing factory installed wiring
  - 9. Testing by recognized testing agency
  - 10. Application of testing agency labels and seals
  - 11. Show dimensions and clearances required.
  - 12. Show performance characteristics and capacities.
- C. Submit Product Data before or concurrent with Samples.
- D. Number of Copies: Submit three copies of Product Data, unless otherwise indicated.

#### 2.2 SAMPLES: Submit Physical examples to illustrate materials, equipment or workmanship, and to establish standards by which completed work is judged.

- A. Office Samples: Of sufficient size and quantity to clearly illustrate:
  - 1. Functional characteristics of product or material.
  - 2. Full range of color samples.
- B. Field Samples and Mock-Ups:
  - 1. Erect at Project Site at location acceptable to Architect.
  - 2. Construct each complete, including work of all trades required in finish work.

### PART 3 – EXECUTION

#### 3.1 CONTRACTOR'S REVIEW

- A. Review each submittal and check for coordination with other work of the Contract and for compliance with the Contract Documents. Note correction and field dimensions.

Mark with approval stamp before submitting to Architect.

### 3.2 CONTRACTORS RESPONSIBILITIES:

- A. Review and Approve Shop Drawings, Product Data and Samples prior to submission and so indicate over his signature.
- B. Verify:
  - 1. Field measurements
  - 2. Catalog numbers and similar data.
  - 3. Field construction criteria
  - 4. A. D. A. (American w/ Disabilities Act) requirements
- C. Coordinate submittals with requirements of work and Contract Documents.
- D. Contractor's responsibility for errors and omissions in submittals is not relieved by Architect/Engineer's review of submittal.
- E. Contractor's responsibility for deviations in submittals from requirements of the Contract Documents is not relieved by Architect/Engineer's review of submittals.
- F. Notify Architect/Engineer, in writing at time of submission, of deviations in submittals from requirements of Contract Documents.
- G. Begin no work which requires submittals until return of submittals with Architect/Engineer's stamp and initials or signature indicating review.
- H. After Architect/Engineer's review, distribute copies.

### 3.3 ARCHITECT / ENGINEER DUTIES

- A. General: Review submittals with reasonable promptness.
- B. Partial submittals are not acceptable, will be considered nonresponsive, and will be returned without review.
- C. Review for
  - 1. Design Concept
  - 2. Information given in contract documents
- D. Review of separate item does not constitute review of an assembly in which item functions.
- E. Affix stamp initials or signature certifying review of submittal
- F. Return submittals to contractor for distribution.

END OF SECTION

**DIVISION 1 GENERAL REQUIREMENTS**  
**01410 TESTING LABORATORY SERVICES**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 PROCEDURE

- A. Contractor's Testing Laboratory: An independent testing laboratory will be selected BY THE OWNER to inspect and test the materials and methods of construction as hereinafter specified for compliance with the specification requirements of the Contract Documents and to perform such other specialized technical services as required by the Owner or his representative. All testing lab services shall be paid for by the Owner, any re-testing shall be paid by the General Contractor

1.3 QUALIFICATIONS OF TESTING LABORATORY

- A. The Testing Laboratory selected shall meet the basic requirements of ASTM E329 "Standard of Recommended Practice for Inspection and Testing Agencies for Concrete and Steel as Used in Construction", and shall submit to the Contractor, Owner, Architect, and Engineer, a copy of the report of inspection of their facilities made by the Materials Reference Laboratory of the National Bureau of Standards during the most recent tour of such inspections, and shall submit a memorandum stating steps taken to remedy all deficiencies reported by this inspection.
- B. The Testing Laboratory selected shall meet "Recommended Requirements for Independent Laboratory Qualification", latest edition, as published by the American Council of Independent Laboratories.
- C. Testing machines shall be calibrated at interval not exceeding 12 months by devices of accuracy traceable to the National Bureau of Standard or accepted values of natural physical constants. The Testing Laboratory shall submit a copy of certificate of calibration made by an accredited calibration agency.
- D. Tests and inspections shall be conducted in accordance with specified requirements, and if not specified, in accordance with the applicable standards of the American Society of Testing and Materials or other recognized and accepted authorities in the field.

1.4 AUTHORITIES AND DUTIES OF THE LABORATORY

- A. Attending Preconstruction Conferences: The Testing Laboratory shall obtain and review the project plans and specifications with the Architect and Engineer as soon as possible prior to the start of construction. The Laboratory shall attend preconstruction conferences with the Architect, Engineer, Project Manager, General Contractor, and materials suppliers as required to coordinate materials inspection and testing requirements with the planned construction schedule. The Laboratory will participate in such conferences throughout the course of the project.
- B. Outline Testing Program: The Testing Laboratory shall be responsible for outlining a

written detailed testing program conforming to the requirements as specified in the Contract Documents and in consultation with the Contractor, Owner, Architect, and Engineer. The testing program shall contain an outline of inspections and tests to be performed with references to applicable section of the specifications or drawings and a list of personnel assigned to each portion of the work. Such testing program shall be submitted to the Contractor, Owner, Architect, and Engineer five weeks in advance of the start of construction so as not to delay the start of construction. It shall be the Testing Laboratory's responsibility that such program conforms to the requirements of the Specifications and Drawings and falls within the budget for testing laboratory services. If the allocated budget is not sufficient to cover their services as outlined in the Specifications, it shall be the responsibility of the Laboratory to notify the Contractor, Architect, Engineer, and Owner so that the Laboratory services can be modified accordingly prior to the start of construction. Furthermore, the Testing Laboratory shall monitor its expenditures throughout the course of the job and notify immediately the Contractor, Owner, Architect, and Engineer, of any significant deviation from the planned testing program and budget.

- C. Cost Proposal: The Testing Laboratory's proposal to the Contractor shall contain the outlined testing program based on a unit price basis for tests and inspections and on a hourly basis for personnel. A total estimated price shall also be submitted.
- D. Cooperation with Design Team: The Laboratory shall cooperate with the Architect, Engineer, and Contractor and provide qualified personnel promptly on notice.
- E. The Laboratory shall perform the required inspections, sampling, and testing of materials as specified under each section and observe methods of construction for compliance with the requirements of the Contract Documents.
- F. Inspections Required by Government Agencies: The Testing Laboratory shall perform all inspections and submit all reports and certifications as required by all government agencies.
- G. Notification of Deficiencies in the Work: The Laboratory shall notify the Architect, Engineer, and Contractor first by telephone and then in writing of observed irregularities and deficiencies of the work and other conditions not in compliance with the requirements of the Contract Documents.
- H. Reports:
  - 1. Information on Reports: The laboratory shall submit copies of all reports of inspections and tests promptly and directly to the parties named below. All reports shall contain at least the following information:
    - a. Project Name
    - b. Date report issued
    - c. Testing Laboratory name and address
    - d. Name and signature of inspector
    - e. Date of inspection and sampling
    - f. Date of test
    - g. Identification of product and Specification section
    - h. Location on the project
    - i. Identification of inspection or test
    - j. Record of weather conditions and temperature (if applicable)
    - k. Results of test regarding compliance with Contract Documents.
  - 2. Copies: The Laboratory shall send certified copies of test and inspection reports to the following parties:
    - a. 2 copies to the Owner or his representative

- b. 2 copies to the general Contractor
  - c. 1 copy to the Architect
  - d. 1 copy to the Engineer of responsibility
  - e. 1 copy to the supplier of the material tested
  - f. 1 copy to the Mechanical Engineer
- I. Accounting: The Testing Laboratory shall be paid as per section 1.2 Procedure.
- J. Obtaining Product and Material Certifications: The Testing Laboratory shall be responsible for obtaining all product and material certifications from manufacturers and suppliers as specified in the Specifications.
- K. Limitations of Authority: The Testing Laboratory is not authorized to revoke, alter, relax, enlarge upon, or release any requirements of the Specifications or to approve or accept any portion of the work or to perform any duties of the General Contractor and his Subcontractors.

#### 1.5 CONTRACTOR'S RESPONSIBILITY

- A. Cooperation with Design Team: The Contractor shall cooperate with laboratory personnel, provide access to the work, and to manufacturers operations.
- B. Furnishing Samples: The Contractor shall provide to the laboratory representative, samples of materials proposed for use in the work in qualities sufficient for accurate testing as specified.
- C. Finishing Casual Labor, Equipment and Facilities: The Contractor shall furnish casual labor, equipment, and facilities as required for sampling and testing by the laboratory and otherwise facilitate all required inspections and tests.
- D. Advance Notice: The Contractor shall be responsible for notifying the Testing Laboratory sufficiently in advance of operations to allow for assignment of personnel and scheduling of tests.
- E. Payment for Substitution Testing: The Contractor shall arrange with the Testing Laboratory and pay for any additional samples and tests above those required by the Contract Documents as requested by the Contractor for his convenience in performing the work.
- F. Payment for Re-testing: The Contractor shall pay for any additional inspections, sampling, testing, and re-testing as required when initial tests indicate work does not comply with the requirements of the Contract Documents.
- G. Notification of Source Change: The Contractor shall be responsible for notifying the Owner, Architect, Engineer, and Testing Laboratory when the source of any material is changed after the original tests or inspections have been made.
- H. Tests for Suspected Deficient Work: If in the opinion of the Owner, Architect, or Engineer any of the work of the Contractor is not satisfactory, the Contractor shall make all tests that the Owner, Architect or the Engineer deem advisable to determine its proper construction.
- I. Costs incurred in the above section "1.5 contractor's responsibility" shall not be part of the allowance as per section "1.2 procedure" and shall be the responsibility of the General Contractor.

#### 1.6 PAYMENT OF TESTING LABORATORY

- A. The Contractor will pay for all Laboratory services (re: section 1.2 procedure) for testing materials for compliance with the requirements of the contract documents. The Contractor will also pay for testing and re-testing of materials that do not comply with the requirements of the Contract Documents and all other items as specified in these Specifications.

## PART 2 - PRODUCTS (Not Used)

## PART 3 – EXECUTION

### 3.1 SCOPE OF WORK

- A. The work to be performed by the Testing Laboratory shall be as specified in this Section of the Specifications and the contract drawings, and as determined in meetings with the Contractor, Owner, Architect, and Engineer.

### 3.2 EARTHWORK

- A. Foundation:
  - 1. Field inspection of piers and pier steel prior to pouring concrete (if piers are used).
  - 2. Field inspection of slab, grade beams, and steel prior to concrete pouring.

### 3.3 CONCRETE MATERIALS AND POURED PLACE CONCRETE

- A. Concrete Mix Designs: The contractor shall submit for approval by the Engineer and Testing Laboratory at least 15 days prior to the start of construction, concrete mix designs for each class of concrete indicated on the structural drawings and in the specifications. The Contractor shall not begin work until the applicable mix design has been approved.
  - 1. The Contractor acting in conjunction with his Concrete Supplier and the Testing Laboratory shall submit in writing with his mix designs, whether the concrete is to be proportioned by either of the following methods as outlined in ACI 318:
    - a. Field Experience Method
    - b. Laboratory Trail Batch MethodWhen field experience methods are used to select concrete proportions, established proportions as specified in ACI 301 and ACI 211. When Laboratory trail batches are used to select concrete proportions, the procedure as outlined in ACI 318 shall be followed. Prepared test specimens in accordance with ASTM C192 and conduct strength tests in accordance with ASTM C39.
  - 2. Required types of concrete and compressive strengths shall be as indicated on the Structural Drawing and as specified in the various sections of the Specifications.
  - 3. All mix designs shall state the following information:
    - a. Mix design number or code designation by which the Contractor shall order the concrete from the Supplier
    - b. Structural member for which the concrete is designed (i.e. columns, shear walls, footings, etc.)
    - c. Type of concrete whether normal weight or lightweight
    - d. 28 day compressive strength
    - e. Aggregate type, source, size, gradation, fineness modules
    - f. Cement type and brand

- g. Fly ash type and brand (if any)
  - h. Admixtures including air entrainment, water reducers, accelerators, and retarders.
  - i. Slump
  - j. Proportions of each material used
  - k. Water cement ratio and maximum allowable water content
  - l. Method by which the concrete is intended to be placed (bucket, chute, or pump)
4. Concrete Suppliers Record of Quality Control: The concrete supplier's past record of quality control shall be used in the design of the concrete mixes to determine the amount by which the average concrete strength  $F_{cr}$  should exceed the specified strength  $f'_c$  as outlined in ACI 318. If a suitable record of test result is not available, the average strength must exceed the design strength by 1200 PSI as specified in ACI 318. After sufficient data becomes available from the job, the statistical methods of ACI 214 may be used to reduced the amount by which the average strength must exceed  $f'_c$  as outlined in ACI 318.
5. Admixtures:
- a. Admixtures to be used in concrete shall be subject to the approval of the Engineer and Testing Laboratory.
  - b. Quantities of admixtures to be used shall be in strict accordance with the manufacturers instructions.
  - c. Admixtures containing chlorine ions shall not be used in prestressed concrete, in concrete containing galvanized or aluminum embedments, or in metal deck floors or roofs.
  - d. Air entraining admixtures shall conform to "Specification for Air Entraining Admixtures for Concrete" ASTM C260.
  - e. Water reducing admixtures, retarding admixtures accelerating admixtures, water reducing and retarding admixtures, and water reducing and accelerating admixtures shall conform to "Specification for Chemical Admixtures for Concrete" ASTM C494
  - f. Fly ash or other pozzolons, used as admixtures, shall conform to "Specification for Fly Ash and Raw or Calcined Natural Pozzolons for use in Portland Cement Concrete" ASTM C618. Obtain mill test reports for approval. Maximum fly ash content shall be 20%.
  - g. Use amounts of admixtures as recommended by the manufacturer for climatic conditions prevailing at the time of placing. Adjust quantities of admixtures as required to maintain quality control.
6. Slump Limits: Unless shown otherwise on the structural drawings, proportion and design mixes to result in concrete slump at the point of placement as follows:
- a. Ramps and Sloping surfaces - 3" +/- 1"
  - b. Foundation concrete -4-1/2" +/- 1-1/2"
  - c. All other concrete -4" +/- 1"
- When increase workability, pumpability, lower water-cement ratio, shrinkage reduction, or permeability reduction is required, then a superplasticizer admixture shall be considered for use. The maximum slump with the use of superplasticizers shall be 8 inches unless approved otherwise by the Architect/Engineer and Testing Laboratory.
- Any deviation from these values (such as concrete design to be pumped) shall be submitted to the Engineer and Testing Laboratory for approval.
7. Adjustments of Concrete Mixes: Mix design adjustments may be requested by the

contractor when characteristics of materials, job conditions, weather, test results, or other circumstances warrant. Such mix design adjustments shall be provided at no additional cost to the Owner. Any adjustments in approved mix designs including changes in admixtures shall be submitted in writing to the Engineer and Testing Laboratory for approval prior to field use.

8. Shrinkage: All concrete shall be proportioned for a maximum allowance unit shrinkage of 0.03% at 28 days as determined by ASTM C 157.
9. Chloride Ion Content: A written submittal shall be made with each design proposed for use on the project that the chloride ion content from all ingredients including admixtures will not exceed the limits specified in the Cast-In-Place section of the Specifications.

B. Concrete Test Cylinders by the Testing Laboratory:

1. Molding and Testing: Cylinders for strength tests shall be molded and Laboratory cured in accordance with ASTM C31 "Method of making and Curing Concrete Test Cylinders in the Field" and tested in accordance with ASTM C39 "Method of Testing for Compressive Strength of Cylindrical Concrete Specimens".
2. Field Samples: Field samples for strength test shall be taken in accordance with ASTM C172 "Method of Sampling Fresh Concrete".
3. Frequency of Testing: Each set of test cylinders shall consist of a minimum of four standard test cylinders. A set of test cylinders shall be made according the following frequency guidelines:
  - a. One set for each class of concrete taken not less than once a day.
  - b. Piers: One set for each 50 cubic yards or fraction thereof.
  - c. Underreamed Footings: One set for each 50 cubic yards or fraction thereof.
  - d. Walls: One set for each 150 cubic yards.
  - e. Spread Footings: One set for each 50 cubic yards or fraction thereof.
  - f. Floors: One set for each 150 cubic yards or fraction thereof but not less than one set for each 5000 square foot of floor area.
  - g. Columns: one set for each 50 cubic yards or fraction thereof with a minimum of 2 sets per floor.
  - h. All other Concrete: A minimum of one set for each 150 cubic yards or fraction thereof.
  - i. No more than one set of cylinders at a time shall be made from any single truck.
  - j. If the total volume of concrete is such that the frequency of testing as specified above would provide less than five strength tests for a given class of concrete, tests shall be made from at least five randomly selected batches or from each batch if fewer than five batches are used.
  - k. The above frequencies assume that one batch plant will be used for each pour. If more than one batch plant is used, the frequencies cited above shall apply for each plant used.

The cylinders shall be numbered, dated, and the point of concrete placement in the building recorded. Of the four cylinders per set break one at seven days, two at 28 days, and one automatically at 56 days only if either 28 day cylinder break is below required strength.
4. Cylinders Storage Box: The Contractor shall be responsible for providing a protected concrete cylinder storage box at a point on the job site mutually agreeable with the Testing Laboratory for the purpose of storing concrete cylinders until they are transported to the Laboratory.
5. Transporting Cylinders: The Testing Laboratory shall be responsible for



transporting the cylinders to the Laboratory in a protected environment such that no damage or ill effect will occur to the concrete cylinders.

6. Information on Concrete Test Reports: The Testing Laboratory shall make and distribute concrete test reports after each job cylinder is broken. Such reports shall contain the following information:
    - a. Truck number and ticket number
    - b. Concrete Batch Plant
    - c. Mix design number
    - d. Accurate location of pour in the structure
    - e. Strength requirement
    - f. Date cylinders made and broken
    - g. Technician making cylinders
    - h. Concrete temperature at placing
    - i. Air temperature at point of placement in the structure.
    - j. Amount of water added to the truck at the batch plant and at the site and weather it exceeds the amount allowed by the mix design.
    - k. Slump
    - l. Unit weight
    - m. Air weight
    - n. Cylinder compressive strengths with type of failure if concrete does not meet Specification requirements. Seven day breaks are to be flagged if they are less than 60% of the required 28 day strength. 28 day breaks are to be flagged if either cylinder fails to meet Specification requirements.
- C. Other Required Tests of Concrete by the Testing Laboratory (unless noted otherwise)
1. Slump Tests: Slump Tests (ASTM C143) shall be made at the beginning of concrete placement for each batch plant and for each set of test cylinders made.
  2. Air Entrainment: Air Entrainment (ASTM C233) tests shall be made at the same time slump tests are made as cited above.
  3. Concrete Temperature: Concrete temperature at placement shall be measured at the same time slump tests are made as cited above.
  4. Chloride Ions: The Contractor shall have the laboratory verify in a written submittal with the mix designs that the chloride ion concentration will not exceed the limits specified. Tests shall be run for each class of concrete according to AASHTO Designation T 260-82 Sampling and Testing for Total Chloride Ion in Concrete and Concrete Raw Materials to determine that the maximum chloride ion content does not exceed the limits stated in the concrete section of the specifications. One test shall be run for each set of cylinders specified to be taken for each class of concrete.
- D. Evaluation and Acceptance of Concrete:
1. Strength Test: A strength test shall be defined as the average strength of two 28 day cylinder breaks from each set of cylinders.
  2. Acceptance Criteria: The strength level of and individual class of concrete shall be considered satisfactory if both of the following requirements are met:
    - a. The average of all sets of three consecutive strength tests equal or exceed the required  $f'_c$ .
    - b. No individual strength test (average of two 28 day cylinder breaks) falls below the required  $f'_c$  by more than 500 PSI.If either the above of the requirements is not met, the Testing Laboratory shall immediately notify the Engineer by telephone. Steps shall immediately be taken to increase the average of subsequent strength tests.

- E. Investigation of Low Strength Concrete Test Results:
1. Contractor Responsibility for Low Strength Concrete:  
If any strength test of Laboratory cured cylinders falls below the required  $f'c$  by more than 500 psi, the Contractor shall take steps immediately to assure that the load carrying capacity of the structure is not jeopardized.
  2. Nondestructive Field Tests: The Testing Laboratory shall under the direction of the Engineer perform nondestructive field tests of the concrete in question using Swiss Hammer, Windsor Probe, or other appropriate methods as approved by the Engineer and report the results in the same manner as for cylinder test reports.
  3. Core Tests: If the likelihood of low strength concrete is confirmed and computations indicate that the load carrying capacity of the structure has been significantly reduced, tests of cores by the Testing Laboratory, drilled from the area in question under the direction of the Engineer, will be required in accordance with ASTM C42 "Method of Obtaining and Testing Drilled Cores and Sawed Beams of Concrete". In such case, three cores shall be taken for each strength test more than 500 psi below required  $f'c$ . If concrete in the structure will be dry under service conditions, cores shall be air dried (temperature 60 degrees to 80 degrees Fahrenheit, relative humidity less than 60 percent) for 7 days before test and shall be tested dry. If concrete in the structure will be more than superficially wet under service conditions, cores shall be immersed in water for at least 48 hours and tested wet. The Contractor shall fill all holes made by drilling cores with an approved drypack concrete.
  4. Acceptance Criteria for Core Tests: Concrete in an area represented by core tests shall be considered structurally adequate if the average of three cores is equal to at least 85% of  $f'c$  and if no single core is less than 75% of  $f'c$ . If approved by the Engineer, locations of erratic core strengths may be retested to check testing accuracy.
  5. Load Test: If the above criteria are not met and the structural adequacy remains in doubt, the Engineer may order a load test as specified in ACI 318 for the questionable portion of the structure.
  6. Strengthening of the Structure or Demolition: If the structural adequacy of the affected portion of structure remains in doubt, the Engineer may order the structure to be strengthened by an appropriate means or demolished and rebuilt.
  7. Cost of Investigations for Low Strength Concrete: The cost of all investigations of low strength concrete shall be borne by the Contractor.
- F. Job Site Inspection: The scope of the work to be performed by the inspector on the jobsite shall be as follows:
1. Verify that air temperatures at the point of placement in the structure are within acceptable limits defined above prior to ordering of concrete by the Contractor.
  2. Inspect concrete upon arrival to verify that the proper concrete mix number, type of concrete, and concrete strength is being placed at the proper location.
  3. Inspect plastic concrete upon arrival at the job site to verify proper batching. Observe mix consistency and adding water as required to achieve target slumps in mix designs. Record the amount of water added and note if it exceeds that allowed in the mix design. The responsibility for adding water to trucks at the job site shall rest only with the Contractor's designated representative. The Contractor is responsible that all concrete placed in the field is in conformance to the Contract Documents.
  4. Obtain concrete test cylinders.
  5. Perform slump test and air entrainment tests.

6. Record information for concrete test reports.
  7. Verify that all concrete being placed meets job Specifications. Report concrete not meeting the specified requirements and immediately notify the Contractor, Batch Plant Inspector, Contractor, Architect, Engineer, and Owner.
  8. Pick up and transport to Laboratory, cylinders cast the previous day.
  9. Check concrete placing techniques to determine that concrete deposited is uniform and that vertical drop does not exceed six feet.
  10. The job site inspector shall report an irregularities that occur in the concrete at the job site or test results to the Contractor, Architect, Owner, and Engineer.
- G. Causes for Rejection of Concrete: The Contractor shall reject all concrete delivered to the site for any of the following reasons:
1. Wrong class of concrete (incorrect mix design number).
  2. Air temperature: Air temperature limits shall be as follows:
    - A. Cold Weather: Air temperature must be 40 degrees Fahrenheit and raising.
    - B. Hot Weather: Air temperature must be cooler than 100 degrees.  
Concrete may be placed at other air temperature ranges only with approval of the job inspector for the Testing Laboratory or other duly appointed representative.
  3. Concrete with temperatures exceeding 95 degrees Fahrenheit may not be placed in the structure.
  4. Air contents outside the limits specified in the mix designs.
  5. Slumps outside the limits specified in the mix designs.
  6. Excessive Age: Concrete shall be discharged within 90 minutes of plant departure or before it begins to set if sooner than 90 minutes unless approved by the Laboratory job inspector or other duly appointed representative.  
The Contractor is responsible that all concrete placed in the field is in conformance to the Contract Documents.
- H. Concrete Batch Trip Tickets: All concrete batch tickets shall be collected and retained by the Contractor. Comprehensive strength, slump, air, and temperature test shall be identified by reference to a particular trip ticket. All ticket shall contain the information specified in ASTM C 94. Each ticket shall also show the amount of water that may be added in the field for the entire batch that will not exceed the specified water cement ratio for the design mix. The Contractor and Testing Laboratory shall immediately notify the Architect/Engineer and each other of tickets not meeting the criteria specified.

END OF SECTION

**DIVISION 1 GENERAL REQUIREMENTS**  
**01700 PROJECT CLOSEOUT**

**PART 1 – GENERAL**

**1.1 SUMMARY**

- A. This section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
  - 1. Inspection procedures
  - 2. Record Drawings
  - 3. Record Specifications
  - 4. Record Product Data
  - 5. Final Cleaning
- B. All closeout documents shall be also provided in PDF format on a USB flash drive.

**1.2 SUBSTANTIAL COMPLETION**

- A. Preliminary Procedures: Before requesting inspection for certification of Substantial Completion, complete the following. List items below that are incomplete in request.
  - 1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
  - 2. Advise Owner of pending insurance changeover requirements.
  - 3. In the Application for Payment that coincides with the date Substantial Complete is claimed, show 100 percent completion for the portion of the work claimed substantially complete.
  - 4. Submit specific warranties, workmanship bonds, maintenance agreements, final certifications and similar documents.
  - 5. Obtain and submit releases permitting Owner unrestricted use of Work and access to services and utilities. Include occupancy permits, operating certificates and similar releases.
  - 6. Submit record drawings, operation and maintenance manuals, final completion project photographs, damage or settlement survey, property survey, and similar record information.
  - 7. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
  - 8. Change-over permanent locks and transmit keys to the Owner.
  - 9. Completion start-up testing of systems, and instruction of the Owner's personnel.
  - 10. Remove temporary facilities from the site, along with construction tools, mock-ups, and similar elements.
  - 11. Complete final clean-up, including touch-up painting. Touch-up and repair and restore marred exposed finishes.
- B. Inspection Procedures: On receipt of a request for inspection, the Architect will proceed or advise the Contractor of unfilled requirements. The Architect will prepare the Certificate of Substantial Completion following inspection, or advise the Contractor of construction that must be completed or corrected before the Certificate will be issued.
  - 1. The Architect will repeat inspection when requested and assured that the Work has been substantially completed.
  - 2. Results of the completed inspection will form the basis of requirements for final

acceptance.

### 1.3 FINAL ACCEPTANCE

- A. Before requesting inspection for certification of final acceptance and final payment, complete the following:
  - 1. Submit the final payment request with releases.
  - 2. Submit a final statement, accounting for changes to the Contract Sum.
  - 3. Submit an officially notarized copy of the Architect's final punch-list of itemized work to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance and has been endorsed and dated by the Architect.
  - 4. Submit final meter readings for utilities, a record of stored fuel, and similar data as of Substantial Completion.
  - 5. Submit consent of surety to final payment.
  - 6. Submit evidence of continuing insurance coverage complying with insurance requirements.
  - 7. Submit pest-control final inspection report and warranty
- B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractors of construction that must be completed or corrected before certificate will be issued.
- C. Re-inspection Procedure: The Architect will reinspect the Work upon receipt of the contractor's notice that the work, including punch-list items resulting from earlier inspections, has been completed, except for those items whose completion has been delayed because of circumstances that are acceptable to the Architect.
  - 1. Upon completion of reinspection, the Architect will either prepare a certificate of final acceptance, or will advise the Contractor of work that is incomplete or of obligations that have not been fulfilled, but are required for final acceptance.
  - 2. If necessary, the reinspection procedure will be repeated.

## PART 2 PRODUCTS

### 2.1 RECORD DOCUMENT SUBMITTAL

- A. Do not use Record Documents for construction purposes; protect from loss in a secure location; provide access to Record Documents for the Architect's reference.
- B. Provide all closing documents in PDF format on a USB flash drive and a hard copy of all documents.

### 2.2 RECORD DRAWINGS

- A. Maintain a clean, undamaged set of prints of Contract Drawings and Shop Drawings.
  - 1. Mark-up these drawings to show the actual installation. Mark whichever drawing is most capable of showing conditions accurately.
    - a. Give particular attention to concealed elements that would be difficult to measure at a later date.
    - b. Organize record sheets into manageable sets, bind with durable paper cover sheets, and print suitable titles, dates and other identification on the cover.
    - c. Accurately record information in an understandable drawing technique.

- d. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.
2. Content: Types of items requiring marking include, but are not limited to, the following:
    - a. Dimensional changes to Drawings
    - b. Revisions to details shown on Drawings
    - c. Depths of foundation below first floor
    - d. Locations and depths of underground utilities
    - e. Revisions to routing of piping and conduits
    - f. Revisions to electrical circuitry
    - g. Actual equipment locations
    - h. Duct size and routing
    - i. Locations of concealed internal utilities
    - j. Changes made by Change Order or Construction Change Directive
    - k. Changes made following Architect's written orders
    - l. Details not on the original Contract Drawings
    - m. Field records for variable and concealed conditions
    - n. Record information on the Work that is shown only schematically
  3. Mark the Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions, completely and accurately. If Shop Drawings are marked, show cross-reference on the Contract Drawings.
  4. Mark important additional information that was either shown schematically or omitted from original Drawings.
  5. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.

### 2.3 RECORD SPECIFICATIONS

- A. Maintain one copy of the Project Manual, including addenda. Mark to show variations in actual Work performed in comparison with the Specifications and modifications.
  1. Give particular attention to substitutions, selection of options and similar information on elements that are concealed or cannot be readily discerned later by direct observation.
  2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
  3. Record the name of manufacturer, supplier, installer, and other information necessary to provide a record of selections made.
  4. For each principal product, indicate whether Record Product Data has been submitted in operation and maintenance manuals instead of submitted as Record Product Data.
  5. Note related record drawing information and Product Data.
- B. Upon completion of the Work, submit record Specifications to the Architect for the owner's record.

### 2.4 MAINTENANCE MANUALS

- A. Organize maintenance data into sets of manageable size. Bind in individual heavy-duty ring vinyl-covered binders, with pocket folders for folded sheet information. Mark identification on front and spine of each binder. Include the following information:
  1. Emergency instructions.

2. Spare parts list.
3. Copies of warranties.
4. Wiring diagrams.
5. Recommended "turn around" cycles.
6. Inspection procedures.
7. Shop Drawings and Product Data.
8. Fixture lamping schedule.

## 2.5 OPERATING AND MAINTENANCE INSTRUCTIONS

- A. Arrange for the installer of equipment that requires regular maintenance to meet with the Owner's personnel to provide instruction in proper operation and maintenance. Include a detailed review of the following:
  1. Maintenance manuals.
  2. Spare parts and materials.
  3. Tools.
  4. Lubricants.
  5. Control sequences.
  6. Hazards.
  7. Warranties and Bonds.
  8. Maintenance agreements and similar continuing commitments.
- B. As part of instruction for operating equipment, demonstrate the following procedures:
  1. Start-up and shut-down.
  2. Emergency operations.
  3. Noise and vibration adjustments.
  4. Safety procedures.

## PART 3 - EXECUTION

### 3.1 FINAL CLEANING

- A. General: Provide final cleaning. Employ experienced workers for final cleaning. Clean each surface to the condition expected in a commercial building cleaning maintenance program.
- B. Cleaning agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.
  1. Complete the following before inspection for certification of Substantial Completion:
    - a. Remove labels that are not permanent labels.
    - b. Clean transparent materials. Remove glazing compound. Replace chipped or broken glass.
    - c. Clean exposed hard-surface finishes to a dust-free condition, free of stains, films and similar foreign substances. Restore reflective surfaces to their original reflective condition. Leave concrete floors broom clean. Vacuum carpeted surfaces.
    - d. Wipe surfaces of mechanical and electrical equipment. Remove excess lubrication. Clean plumbing fixtures to a sanitary condition. Clean light fixtures and lamps.
    - e. Clean the site of rubbish, litter and other foreign substances. Sweep paved

- areas; remove stains, spills and other foreign deposits. Rake grounds that are neither paved nor planted, to a smooth even-textured surface.
- f. Clean surfaces of mechanical and electrical equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
  - g. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers and grills.
  - h. Clean ducts, blowers and coils if units were operated without filters during construction.
  - i. Clean light fixtures, lamps, globes and reflectors to function with full efficiency. Replace burned-out bulbs, and those noticeable dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirement for new fixtures.
  - j. Leave Project clean and ready for occupancy.

### 3.2 PEST CONTROL

- A. Engage an experienced exterminator to make a final inspection, and rid the Project of rodents, insects and other pests.

### 3.3 REMOVAL OF PROTECTION

- A. Remove temporary protection and facilities.

### 3.4 COMPLIANCE

- A. Comply with regulations of authorities having jurisdiction and safety standards for cleaning. Remove waste materials from the site and dispose of in a lawful manner.

END OF SECTION



**DIVISION 1 GENERAL REQUIREMENTS**  
**01740 WARRANTIES AND BONDS**

PART 1 GENERAL

1.1 SUMMARY

- A. This section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
  - 1. Warranties
  - 2. Bonds
- B. Standard Products Warranties are reprinted written warranties published by individual manufacturers for particular products and are specifically endorsed by the manufacturer to the Owner.
- C. Special Warranties are written warranties required by or incorporated in Contract Documents, to extend time limits provided by standard warranties or to provide greater rights for the Owner.

PART 2 PRODUCTS

2.1 WARRANTY DOCUMENTS

- A. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.
  - 1. Bind warranties and bonds in heavy-duty, 3 ring, vinyl covered, loose leaf binders, thickness as necessary to accommodate contents. Provide typed tabs for each separate item.
  - 2. Copies of each warranty to be included in the Operation and Maintenance Manuals.

PART 3 EXECUTION

3.1 DISCLAIMERS AND LIMITATIONS:

- A. Manufacturer's disclaimers and limitation on product warranties do not relieve the Contractor of the warranty on the Work that incorporates the products, nor does it relieve suppliers, manufacturers, and Subcontractor required to countersign warranties with the Contractor.

3.2 RELATED DAMAGES AND LOSSES:

- A. When correcting warranted Work that has failed, remove and replace other Work that has been damaged as a result of such failure or that must be removed and replaced to provide access for correction of warranted Work.

3.3 REINSTATEMENT OF WARRANTY:

- A. When Work covered by a warranty has failed and been corrected, reinstate the warranty by written endorsement. The reinstated warranty shall be equal with an equitable adjustment for depreciation.

### 3.4 REPLACEMENT COSTS:

- A. On determination that Work covered by a warranty has failed, replace or rebuild the Work to an acceptable condition complying with requirements of Contract Documents. The Contractor is responsible for the cost of replacing or rebuilding defective Work regardless of whether the Owner has benefited from the use of the Work through part of its useful service life.
- B. Submit written warranties to the Architect prior to the date certified for Substantial Completion. If the Architect's Certificate of Substantial Completion designates a commencement date for warranties other than the date of Substantial Completion, submit written warranties on the Architect's request.

### 3.5 CONTRACTOR'S GUARANTEE:

- A. The Contractor does hereby guarantee all equipment, apparatus and parts against defects in design workmanship, or material where not otherwise specified for a period of not less than **(2) TWO** years after completion of Contract. Any parts found to be defective shall be replaced at the Contractor's expense. In the event that one or more of the defects mentioned above shall appear within the specified period, the Owner shall have the right to continue to use or operate the defective part of the apparatus until the Contractor is able to make repairs or replacements, or until such time as it can be taken out of service without loss or inconvenience to the Owner. In case of defective minor parts, the Owner may, at his own expense, do the work of installing replaced defective parts, provided he finds it is to his interest to do so.
  - 1. Refer to mechanical drawings and specifications for warranties on compressors and mechanical equipment that might be different from above.

### 3.6 MANUFACTURERS GUARANTEE: **20 years N.D.L. for roofs, typical.**

END OF SECTION

**DIVISION 2 SITE WORK**  
**02070 SELECTIVE DEMOLITION**

PART 1 GENERAL

1.1 SUMMARY

- A. Extent: Extent of selective demolition work is indicated on drawings.
- B. Types of Selective Demolition Work: Demolition requires the selective removal and subsequent offsite disposal of the following:
  - 1. Entire Building and or portions of buildings structure indicate on drawings and as required to accommodate new construction.
  - 2. Shutoff, capping, and continuation of utility services as required, together with details for dust and noise control.

1.2 PROJECT CONDITIONS

- A. Owner will be continuously occupying areas of the building immediately adjacent to areas of selective demolition.
  - 1. Conduct selective demolition work in manner that will minimize need for disruption of Owner's normal operations.
  - 2. Provide minimum of 72 hours advance notice to Owner of demolition activities which will impact Owner's normal operation.
- B. Owner assumes no responsibility for buildings and structures to be demolished.
  - 1. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
  - 2. Before building demolition, Owner will remove items they will retain prior to demolition beginning.
- C. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
  - 1. If material suspected of containing hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.

1.3 COORDINATION

- A. Arrange demolition schedule so as not to interfere with operations of adjacent occupied buildings.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 CONDITION OF STRUCTURES:

- A. Owner assumes no responsibility for actual condition of item or structures to be demolished.

3.2 PROTECTION:

- A. Provide temporary barricades another forms of protection as required to protect Owner's

- personnel and general public from injury due to selective demolition work.
- B. Protect from damage existing finish work that is to remain in place and becomes exposed during demolition operations.
  - C. Construct temporary insulated solid dustproof partitions where required to separate areas where noisy or extensive dirt or dust operations are performed. Equip partitions with dustproof doors and security locks of required.
  - D. Remove protection at completions of work.

### 3.3 DAMAGES:

- A. Promptly repair damages caused to adjacent facilities by demolition work at no cost to Owner.

### 3.5 TRAFFIC:

- A. Conduct selective demolition operations and debris removal in a manner to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities.

### 3.6 UTILITY SERVICES:

- A. Maintain existing utilities indicated remain, keep in service, and protect against damage demolition operations.

### 3.7 INSPECTION:

- A. Prior to commencement of selective demolition work, inspection areas win which work is to be performed.
- B. Photograph existing condition to structure surfaces, equipment or to properties which could be misconstrued as damage resulting from selective demolition work; file with Owner's Representative prior to stating work.

### 3.8 PREPARATION:

- A. Provide interior and exterior shoring, bracing, or support to prevent movement, settlement or collapse to be demolished and adjacent facilities to remain.
- B. Cease operation and notify Owner's Representative immediately if safety of structure appears to be endangered.
  - 1. Take precautions to support until determination is made for continuing operations.
- C. Erect and maintain dust-proof partitions and closures as required to prevent spread of dust or fumes to occupied portions of the building.
- D. Provide weatherproof closures for exterior openings resulting from demolition work.
- E. Provide by-pass connections as necessary to maintain continuity of service to occupied areas of building.
  - 1. Provide minimum of 72 hours advance notice to Owner if shut-down of service is necessary during change-over.

### 3.9 DEMOLITION:

- A. Perform selective demolition work in a systematic manner.
- B. Demolish concrete and masonry in small sections. Cut concrete and masonry at junctures with construction to remain using power-driving masonry saw or hand tools; do not use power-driven impact tools.
- C. Locate demolition equipment throughout structure and promptly remove debris to avoid imposing excessive loads on supporting wall, floors or framing.
- D. Provide services for effective air and water pollution controls as required by local authorities having jurisdiction.
- E. Demolish foundation walls to a depth of not less than 12" below existing ground surface.
  - 1. Demolish and remove below-grade wood or metal construction.
  - 2. Breakup below-grade concrete slabs.
- F. For interior slabs on grade, use removal methods that will not crack or structurally disturb adjacent slabs or partitions. Use power saw where possible.
- G. Completely fill below-grade areas and voids resulting from demolitions work.
  - 1. Provide fill consisting of approved earth, gravel, or sand, free of trash and debris, stones over 6" diameter, roots or other organic matter.
- H. If unanticipated mechanical, electrical or structural elements which conflict with function or design are encountered, investigate and measure both nature and extent of conflict.
  - 1. Submit report to Owner's Representative in written, accurate detail. Pending receipt of directive from Owner's Representative rearrange selective demolition schedule as necessary to continue overall job progress without delay.

### 3.10 SALVAGE ITEMS:

- A. Where indicated on Drawings as "Salvage-Deliver to Owner," carefully remove indicated items, clean, store and turn to Owner and obtain receipt.

### 3.11 DISPOSAL OF DEMOLITION MATERIALS:

- A. Remove debris, rubbish and other materials resulting from demolition operations from building site. Transport and legally dispose of materials off site.
  - 1. Burning of removed materials is not permitted on project site.

### 3.12 CLEAN-UP AND REPAIR:

- A. Upon completion of demolition work, remove tools, equipment and demolished materials from site. Remove protection and leave interior areas broom clean.
- B. Repair demolition performed in excess of that required.
  - 1. Return structures and surfaces to remain to condition existing prior to commencement of selective demolition work.
  - 2. Repair adjacent construction or surfaces soiled damages by selective demolition work.
- C. Protect existing trees and vegetation to remain from physical damage. Do not store materials or equipment within tree drip line.

END OF SECTION

**DIVISION 2 SITE WORK**  
**02110 SITE CLEARING**

**PART 1 GENERAL**

**1.1 SCOPE**

- A. Includes site clearing, trees removal and demolition of minor structures. Coordinate with other "site work" sections.
- B. Disposal of all debris resulting from clearing and grubbing work.

**1.2 PROTECTION**

- A. Provide temporary fences, barricades, coverings, or other forms of protection to preserve existing items indicated to remain and to prevent injury or damage to persons or property.
- B. Apply protections to adjacent properties as required.

**PART 2 PRODUCTS**

**2.1 MATERIALS**

- A. Provide materials required to perform work as specified.

**PART 3 EXECUTION**

**3.1 SITE CLEARING:**

- A. **TRAFFIC:** Conduct site clearing operations to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities. Do not close or obstruct streets, walks or other occupied or used facilities without permission from authorities having jurisdiction.
- B. **RESTORE DAMAGED WORK:** Restore damaged work to conditions existing prior to start of work, unless otherwise directed.
- C. **TREES:** Protect existing trees and vegetation to remain from physical damage. Do not store materials or equipment within tree drip line. Use licensed arborist for tree damage repair. Replace damaged trees that cannot be restored to full growth, as determined by arborist, unless otherwise acceptable to Architect.
- D. **UTILITIES:** Maintain existing utilities and protect from damage during demolition operations. Do not interrupt existing utilities; provide temporary services if required, as acceptable to the Architect.
- E. **SITE CLEARING:** Remove existing orchard, remove trees, shrubs, grass, and other vegetation, improvements, or obstructions as indicated or which interfere with new construction. Removal includes digging out stumps and roots. Level land prior to commencement.
- F. **TOP SOIL:** Strip and stockpile topsoil that will be reused in the work.
- G. **VOIDS:** Fill below-grade areas and voids resulting from demolition operations. Use satisfactory soil materials, place in 6" deep horizontal layers with each layer thoroughly

compacted.

- H. GRADE: Grade surface to conform to required contours and to provide surface drainage.

### 3.2 REMOVAL OF DEBRIS AND CLEANUP

- A. REMOVE EXISTING IMPROVEMENTS: Remove existing improvements, both above-grade and below to extent indicated or as otherwise required to permit new construction.
- B. SAVEABLE ITEMS: Carefully remove items indicated to be salvaged, and store on Owner's premises where indicated or directed.
- C. AIR POLLUTION: Control air pollution caused by dust and dirt; comply with governing regulations.
- D. DISPOSED ITEMS: Dispose of removed and demolished items, including trash and debris, off Owner's property.
- E. BURNING WASTE: Burning of waste materials on site is not permitted.

END OF SECTION

**DIVISION 2 SITE WORK**  
**02150 SHORING AND BRACING**

**PART 1 GENERAL**

**1.1 GENERAL DESCRIPTION OF WORK**

- A. Building excavation is specified in another Division-2 section.
- B. Engage and assign supervision of shoring and bracing work to a qualified consultant.
- C. All work must be done in accordance with these specifications and comply with local codes and ordinances of governing authorities having jurisdiction.

**1.2 JOB CONDITIONS**

- A. Before starting work, check and verify governing dimensions and elevations. Survey condition of adjoining properties, take photographs, recording existing settlement or cracking of structures, pavements, and other improvements. Prepare a list of such damages, verify by dated photographs, and signed by Contractor and others conducting investigation.
- B. Survey of adjacent structures and improvements, establishing exact elevations at fixed points at act as benchmarks. Clearly identify benchmarks and record existing elevations. Locate datum level used to establish benchmark elevations sufficiently distant so as not to be affected by movement resulting from excavation operations, etc.
- C. During construction re-survey benchmarks weekly, employing licensed Land Surveyor or registered Professional Engineer, licensed in State of Project. Maintain accurate log of surveyed elevations for comparison with original elevations. Promptly notify Architect if changes in elevations occur or if cracks, sags or other damage is evident.

**PART 2 PRODUCTS**

**2.1 MATERIALS**

- A. Provide suitable shoring and bracing materials which will support loads imposed

**PART 3 EXECUTION**

**3.1 EXISTING UTILITIES**

- A. Protect existing active utility services and structures from damage during shoring and bracing work. Repair or replace damages to satisfaction of utility Owner.

**3.2 SHORING**

- A. Protect site from caving and unacceptable soil movement. Where shoring is required, locate system to clear permanent construction and to permit forming and finishing of concrete surfaces. Provide shoring system adequately anchored and braced to resist earth and hydrostatic pressures
- B. Shoring systems retaining earth on which support or stability of existing structures is dependent must be left in place at completion of work. If wood is part of shoring system near existing structures, use pressure preservative treated materials or remove before placement of backfill.



### 3.3 BRACING

- A. Locate bracing to clear columns, floor framing constructions, and other permanent work. If necessary to move a brace, install new bracing prior to removal of original brace.
- B. Do not place where it will be cast into or include in permanent concrete work, except as otherwise acceptable to Architect.
- C. Install internal bracing, if required, to prevent spreading or distortion to braced frames.
- D. Maintain bracing until structural elements are rebraced by other bracing or until permanent construction is able to withstand lateral earth and hydrostatic and roof design loads.
- E. Remove sheeting, shoring and bracing in stages to avoid disturbances to underlying soils and damage to structures, pavements, facilities utilities, etc.
- F. Repair or replace adjacent work damaged or displaced through installation or removal of shoring and bracing work.

END OF SECTION

**DIVISION 2 SITE WORK**  
**02200 EARTH WORK**

**PART 1 GENERAL**

**1.1 SCOPE:**

- A. The work required under this section of the Specifications shall include all labor, material, equipment and services necessary for the reasonably incidental to all excavation, grading cuts and fills, backfill and sub-grade work.

**1.2 SUBMITTALS**

- A. Product Data: For the following:
  - 1. Controlled low-strength material, including design mixture.
- B. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated:
  - 1. Classification according to ASTM D 2487 of each on-site and borrow soil material proposed for fill and backfill.
  - 2. Laboratory compaction curve according to ASTM D 698 for each on-site and borrow soil material proposed for fill and backfill.

**1.3 PROJECT CONDITIONS**

- A. Protection of Service lines, Utilities, and existing structures.
  - 1. The location of existing service and/or utility lines whether shown on the Drawings or not shall be verified and known by the Contractor prior to excavation or construction of fills or embankments.
  - 2. The existing lines and structures shall be protected and safeguarded from damage during grading operations and if damaged, shall be repaired by the Contractor at his expense.
  - 3. The above provisions are applicable to all service lines or utilities structures, all or any portion of the ground surface within the grading area.
- B. Active Lines: If an active utility line will be covered by new construction by does not interfere with the construction, is not under pressure, and is not required by local regulations or the Drawings to be removed, it may remain, provided it is in good condition and well protected and provided that all such lines made of concrete pipe are replaced by heavy cast iron pipe for the length covered by new construction, plus and additional five beyond limits of new construction.
- C. Inactive Lines: Remove, plug or cap such lines as directed. In absence of specific requirements or local regulations, plug or cap lines at least three feet outside the new building wall or as required by local regulations.

**PART 2 PRODUCTS**

**2.1 MATERIALS**

- A. Material: Material for backfilling shall consist of excavation soil or other approved materials, and shall be free of trash, or lumber, or other debris.

**PART 3 EXECUTION**

### 3.1 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.
- B. Preparation of Subgrade for earthwork operations including removal of vegetation, topsoil, debris, obstructions and deleterious materials from ground surface is specified in Section 02110 "Site Clearing."
- C. Provide protective insulating materials to protect subgrades and foundation soils against freezing temperatures or frost.

### 3.2 DEWATERING

- A. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.
- B. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.
  - 1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.
  - 2. Install a dewatering system to keep subgrades dry and convey ground water away from excavations. Maintain until dewatering is no longer required.

### 3.3 EXCAVATION AND SPECIAL EARTH REQUIREMENTS:

- A. The work shall consist of all excavation required as shown on the Drawings, including all backfill. All necessary bailing, drainage and pumping or shoring shall include under this section. All surplus earth and debris shall be disposed of by the Contractor.
- B. All general excavation work shall be done in accordance with the requirements of the Drawings and Specifications and in a manner which will insure reasonable accuracy in preserving line and levels shown in the Drawings.
- C. Any additional costs of labor and materials due to careless excavation beyond the lines and depths shown by the Drawings shall be borne by the Contractor.

### 3.3 EXCAVATION FOR STRUCTURES

- A. Excavate for structure to elevations and dimensions shown, extending a sufficient distance to permit placing and removal of other work inspection. Trim bottom to require lines and grades to provide solid base to receive concrete.

### 3.4 EXCAVATION FOR TRENCHES

- A. Excavate for trenches to depth indicated or required and to establish indicated flow lines or invert elevations. Maintain uniform width required for particular item to be installed including width to provide ample working room. Provide 6" to 9" for clearance on both sides of pipe so that top of piping is not less than 3'-6" below finished grade.

### 3.5 BACKFILL AND FILL

- A. Place and compact acceptable soil material in layers to required elevations. Use soil material

free of clay, rock or gravel larger than 2" in any dimension, debris, vegetable matter, waste, and frozen materials. Use sub-base material where indicated under piping or conduit; shape to fit bottom 90 deg. of cylinder.

- B. BACKFILL EXCAVATIONS: Backfill excavations as promptly as work permits.
- C. GROUND SURFACE: Prepare ground surface or receive fill by removing vegetation debris, unsatisfactory soil materials and obstructions. Scarify as required so that fill material will bond with existing surface.
- D. PLACING BACKFILL AND FILL: Place backfill and fill materials in layers not more than 8" in loose depth, compacting each layer to required maximum density. Do not place material on surfaces that are muddy, frozen, or contain ice or frost.
- E. ARCHITECT'S APPROVAL: Architect's approval shall be given on all materials installed for the project prior to backfilling of any excavation. Work not approved, or work concealed prior to approval shall be reinstalled (labor and materials) at Contractor's expense.

### 3.6 COMPACTION

- A. Compact each layer of backfill and fill soil materials and the top 12" of subgrade for structures, slabs, steps and payments to 90% maximum density for cohesive soils and 95% relative density for cohesionless soils. At lawns or unpaved areas, 85% max. density for cohesive soils and 90% relative density for cohesionless soils.
- B. Sprinkle water on surface of subgrade or layers of soil material where soil is too dry to permit compaction to required density. Remove and replace, or scarify and air dry soil material that is too wet to permit compaction to required density.

### 3.7 GRADING

- A. Grade areas indicated, including adjacent, eroded, rutted, or otherwise damaged areas. In damaged compaction areas, scarify surface, reshape, and compact to required density prior to further construction.

### 3.8 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Disposal: Remove excess excavated material, trash, debris, and waste material from site.
- B. Transport surplus satisfactory soil to designated storage areas on Owner's property. Stockpile or spread soil as directed by Architect.
  - 1. Remove waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off Owner's property.

END OF SECTION

**DIVISION 2 SITE WORK**  
**02282 TERMITE CONTROL**

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide soil treatment for termite control, as herein specified. Under main building and sidewalks around perimeter of building.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's technical data and application instructions.

1.3 QUALITY ASSURANCE

- A. Additional Requirements: In addition to requirements of these specifications, comply with manufacturer's instructions and recommendations for work, including preparation of substrate and application.
- B. Licensed Professional: Engage a licensed professional pest control operator, for application of soil treatment solution.
- C. Use only termiticides which bear a Federal registration number of the U.S. Environmental Protection Agency.

1.4 JOB CONDITIONS

- A. Restrictions: Do not apply soil treatment solution until excavating, filling and grading operations are completed, except as otherwise required in construction operations.
- B. To insure penetration, do not apply soil treatment to frozen or excessively wet soils of during clement weather. Comply with handling and application instructions of soil toxicant manufacturer.

1.5 SPECIFIC PRODUCT WARRANTY

- A. Furnish written warranty certifying that applied soil termiticide treatment will prevent infestation of subterranean termites and, that if subterranean termite activity is discovered during warranty period, Contractor will re-treat soil and repair or replace damage caused by termite infestation.
  - 1. Provide warranty for a period of 5 years from date of treatment, signed by Applicator and Contractor.

PART 2 – PRODUCTS

2.1 SOIL TREATMENT SOLUTION

- A. Use emulsible concentrated termiticide for dilution with water, specially formulated to prevent termite infestation. Provide a working solution of one of the following chemicals and concentrations. Use only government approved termite solutions. All chemicals shall be EPA and TCEQ approved.
  - 1. Termidor by Dow Chemical or Premise 75 by Bayer or approved equal.

2. Chloropyrifos ("Dursban TC"); 1.0 percent in water emulsion
  3. Permethrin ("Dragnet", "Torpedo"); 0.5 percent in water emulsion
- B. Other solutions may be used as recommended by Applicator if acceptable to Architect and approved for intended application by local governing authorities. Use only soil treatment solutions which are not injurious to planting or humans.

## PART 3 – EXECUTION

### 3.1 APPLICATION

- A. Surface Preparation: Remove foreign matter which could decrease effectiveness of treatment on areas to be treated. Loosen rake, and level soil to be treated, except previously compacted areas under slabs and foundations. Termiticide may be applied before placement of compacted fill under slabs, if recommended by manufacturer.
- B. Application Rates: Apply soil treatment solution at rates recommended by soil termiticide manufacturer.
- C. Under slab-on grade structures, treat soil before concrete slabs are placed, using the following rates of application:
1. Apply 4 gallons of chemical solution per 10 lin. ft. to soil in critical areas under slab, including entire inside perimeter of foundation walls, along with both sides of interior partition walls, around plumbing pipes and electric conduit penetrating slab, and around interior column footers.
  2. Apply one gallon of chemical solution per 10 sq. ft. as an overall treatment under slab and attached slab areas where fill is soil or unwashed gravel. Apply 1-1/2 gallons of chemical solution to areas where fill is washed gravel or other coarse absorbent material.
  3. Apply 4 gallons of chemical solution per 10 lin. ft. of trench, for each foot of depth from grade to footing, along outside edge of building. Dig a trench 6" to 8" wide along outside of foundation to a depth of not less than 12". Punch holes to top of footing at not more than 12" o.c. and apply chemical solution. Mix chemical solution with the soil as it is being replaced in trench.
- D. Allow not less than 12 hours for drying after application, before beginning concrete placement or other construction activities.
- E. Post signs in areas of application warning workers that soil termiticide treatment has been applied. Remove signs when areas are covered by other construction.
- F. Reapply soil treatment solution to areas disturbed by subsequent excavation or other construction activities following application.

END OF SECTION

**DIVISION 2 SITE WORK**  
**02514 CONCRETE WALKS**

**PART 1 GENERAL**

**1.1 SCOPE OF WORK**

- A. This technical specification includes the furnishing of labor, materials, tools, testing, and equipment necessary to replace or construct Portland Cement Concrete sidewalks, drill for and install steel dowels, and construct driveway ramps and sidewalk ramps with detectable warning strips. Prior to the installation of the concrete, all work within the sidewalk limits shall be complete and shall include, but not be limited to, the adjustments of all public and private frames, grates, covers, and utility boxes.  
  
Extent of Portland cement paving is shown on drawings, including curbs, gutters, walks and paving.

**PART 2 PRODUCTS**

**2.1 MATERIALS**

- A. SUB-BASE: Prepare sub-base as specified in "Earthwork" section.
- B. CONCRETE: Concrete and related materials are specified in Division 3.
  - 1. Compressive Strength: Refer to Div. 3.

**PART 3 EXECUTION**

**3.1 CONSTRUCTION METHODS**

- A. SURFACE PREPARATION: Remove loose material from compacted sub-base surface immediately before placing concrete.
- B. FORM CONSTRUCTION: Set forms to required grades and lines, rigidly braced and secured. Install sufficient quantity of forms to allow continuous progress of work and so that forms can remain in place at least 24 hours after concrete placement.
- C. REINFORCEMENT: Locate, place and support reinforcement as specified in Division-3 sections, unless otherwise indicated.
- D. CONCRETE PLACEMENT: Comply with requirements of Division-3 sections for mixing and placing concrete, and as herein specified.
- E. DO NOT PLACE CONCRETE: Do not place concrete until sub-base and forms have been checked for line and grade. Moisten sub-base if required to provide uniform dampened condition at time concrete is placed. Do not place concrete around manholes or other structures until they are at required finish elevation and alignment.
- F. TOOLED JOINTS: Form weakened-plane joints in fresh concrete by grooving top portion with a recommended cutting tool and finishing edges with a jointer.
- G. CONSTRUCTION JOINTS: Place concrete joints at end of placements and at locations where placement operations are stopped for a period of more than 1/2 hour, except where such placements terminate at expansion joints.
- H. EXPANSION JOINTS: Provide premolded joint filler for expansion joints abutting concrete curbs, catch basins, manholes, inlets, structures, walks, and other fixed objects,

unless otherwise indicated.

### 3.2 CONCRETE FINISHING

- A. After striking-off and consolidating concrete, smooth surface by screeding and floating. Adjust floating to compact surface and produce uniform texture.
- B. After floating test surface to surface to trueness with a 10' straightedge, distribute concrete as required to remove surface irregularities, and refloat repair areas to provide a continuous smooth finish.
- C. Work edges of slabs, gutters, back top edge of curb, and formed joints with an edging tool, and round to 1/2" radius, unless otherwise indicated. Eliminate tool marks on concrete surface.
- D. After completion on floating and troweling when excess moisture or surface sheen has disappeared, complete surface finishing, as follows:
  - 1. BROOM FINISH: Broom finish, by drawing a fine-hair broom across concrete surface, perpendicular to line of traffic. Repeat operation if required to provide a fine line texture.
- E. REPAIR OR REPLACE: Repair or replace broken or defective concrete, as directed.

### 3.3 PROTECTION OF CONCRETE

- A. Protect concrete from damage until acceptance of work. Exclude traffic from pavement for at least 14 days after placement. When construction traffic is permitted, maintain pavement as clean as possible by removing surface stains and spillage of materials as they occur.
- B. Sweep concrete pavement and wash free of stains, discolorations, dirt and other foreign material just prior to final inspection.

END OF SECTION



**DIVISION 4 MASONRY**  
**SECTION 04200 UNIT MASONRY**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. This Section includes unit masonry assemblies consisting of the following:
  - 1. Concrete masonry units (CMUs).
  - 2. Building (common) brick.
  - 3. Mortar and Grout
  - 4. Embedded flashings
  - 5. Dampproofing
- B. See Division 05 Section "Metal Fabrications" for furnishing steel lintels and shelf angles for unit masonry.
- C. See Division 07 Section "Sheet Metal Flashing and Trim" for furnishing manufactured reglets installed in masonry joints for metal flashing.

**1.2 SUBMITTALS**

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For reinforcing steel. Detail bending and placement of unit masonry reinforcing bars. Comply with ACI 315, "Details and Detailing of Concrete Reinforcement." Show elevations of reinforced walls.
- C. Samples for each type and color of exposed masonry units and colored mortars.
- D. Material Certificates: For each type of product indicated. Include statements of material properties indicating compliance with requirements including compliance with standards and type designations within standards.
  - 1. For masonry units include material test reports substantiating compliance with requirements.
  - 2. Submit certification of moisture content, fire resistive rating(s) or compressive strengths(s).
- E. Mix Designs: For each type of mortar and grout. Include description of type and proportions of ingredients.

**1.3 QUALITY ASSURANCE**

- A. Comply with recommendations of Brick Institute of America (BIA), and National Concrete Masonry Assoc. (NCMA). Contractor should get Architect's approval before ordering.
- B. Preconstruction Testing Service: Owner will engage a qualified independent testing agency to perform preconstruction testing indicated below. Payment for these services will be made by Owner.
  - 1. Clay Masonry Unit Test: For each type of unit required, per ASTM C 67.
  - 2. Concrete Masonry Unit Test: For each type of unit required, per ASTM C 140.
  - 3. Mortar Test (Property Specification): For each mix required, per ASTM C 780.
  - 4. Grout Test (Compressive Strength): For each mix required, per ASTM C 1019.
- C. Fire-Resistance Ratings: Where indicated, provide materials and construction identical to those of assemblies with fire-resistance ratings determined per ASTM E 119 by a testing and inspecting agency, by equivalent concrete masonry thickness, or by other means, as acceptable to authorities having jurisdiction.

- D. MOCK WALL: Build mock wall to verify selections made under sample submittals and to demonstrate aesthetic effects. Provide 8' long by 4' high mock wall with window opening. Sample shall be located away from building and be left for the duration of the construction. Mock wall shall be composite of the entire typical wall thickness. Construct conditions showing sill, head, jamb, and terminations with other materials.

#### 1.4 PROJECT CONDITIONS

- A. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.
- B. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.

### PART 2 - PRODUCTS

#### 2.1 ACCEPTABLE MANUFACTURERS

- A. Provide products by the following
  1. Innovative Block
  2. Headwaters Construction Materials
  3. Manufacturers of Equivalent products submitted and approved in accordance with Section 01010, Items 1.18 and 1.29. Architect reserves the right to reject substitution requests based on aggregate, color, polished surface, and gloss, even though structural characteristic, shapes, and materials are equivalent.

#### 2.2 COLORS, TEXTURES, AND PATTERNS

- A. Exposed Masonry Units: As indicated by manufacturer's designations.

#### 2.3 CONCRETE MASONRY UNITS (CMUs)

- A. Shapes: Provide special shapes for lintels, corners, jambs, sashes, movement joints, headers, bonding, and other special conditions for applications where forms, size or finish cannot be produced from standard shapes.
- B. Integral Water Repellent: Provide units made with liquid polymeric, integral water-repellent admixture that does not reduce flexural bond strength for exposed units.
  1. Products:
    - a. Grace Construction Products, a unit of W. R. Grace & Co. - Conn.; Dry-Block.
    - b. Addiment Incorporated; Block Plus W-10.
    - c. Master Builders, Inc.; Rheopel.
    - d. Krete by Krete Industries
- C. Concrete Masonry Units: ASTM C 90.
  1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 1900 psi.
  2. Weight Classification: Normal weight.
- D. Provide Bullnose CMU at:
  1. All corners
  2. All door and window jambs, sills and headers
- E. Provide Grade N load bearing units complying with the following requirements: 4" – at

column furring and chases, 6" CMU – at interior walls, 8" load bearing. (Refer to structural and architectural plans for location and sizes)

1. TYPE: I HOLLOW BLOCK: ASTM C 90. SOLID BLOCK: ASTM C 145. (where indicated)
2. Exposed Faces: Manufacturer's standard color and texture, unless otherwise indicated.
3. Hollow Block: ASTM C 90; SOLID BLOCK: ASTM C 145
4. Color / Texture: Submit samples from full range of manufacturers color samples

## 2.4 CONCRETE MASONRY UNITS – FACE DESIGN

### A. 4" Split-Face CMU

1. Face Pattern: Standard
2. Colors by Headwaters Construction Materials or approved equal:
  - a. Colors to be determined during submittals phase.
3. Manufacturers of Equivalent products submitted and approved in accordance with Section 01010, Items 1.18 and 1.29. Architect reserves the right to reject substitution requests based on aggregate, color, polished surface, and gloss, even though structural characteristic, shapes, and materials are equivalent.

## 2.5 CONCRETE AND MASONRY LINTELS

- A. Concrete Lintels: Precast units matching concrete masonry units and with reinforcing bars indicated or required to support loads indicated.
- B. Masonry Lintels: Made from bond beam concrete masonry units with reinforcing bars placed as indicated and filled with coarse grout.

## 2.6 MORTAR AND GROUT MATERIALS

- A. Portland Cement: ASTM C 150, Type I or II, except Type III may be used for cold-weather construction.
- B. Hydrated Lime: ASTM C 207, Type S.
- C. Mortar Pigments: Iron oxides and chromium oxides, compounded for use in mortar mixes. Use only pigments with a record of satisfactory performance in masonry mortar.
  1. Products:
    - a. Bayer Corporation, Industrial Chemicals Div.; Bayferrox Iron Oxide Pigments.
    - b. Davis Colors; True Tone Mortar Colors.
    - c. Solomon Grind-Chem Services, Inc.; SGS Mortar Colors.
- D. Aggregate for Mortar: ASTM C 144.
  1. For joints less than 1/4 inch thick, use aggregate graded with 100 percent passing the No. 16 sieve.
- E. Aggregate for Grout: ASTM C 404.
- F. Cold-Weather Admixture: Nonchloride, noncorrosive, accelerating admixture complying with ASTM C 494/C 494M, Type C, and recommended by manufacturer for use in masonry mortar of composition indicated.
  1. Products:
    - a. Addiment Incorporated; Mortar Kick.
    - b. Euclid Chemical Company (The); Accelguard 80.
    - c. Grace Construction Products, a unit of W. R. Grace & Co. - Conn.; Morset.
    - d. Sonneborn, Div. of ChemRex; Trimix-NCA.

- G. Water-Repellent Admixture: Liquid water-repellent mortar admixture intended for use with concrete masonry units, containing integral water repellent by same manufacturer.
1. Products:
    - a. Addiment Incorporated; Mortar Tite.
    - b. Grace Construction Products, a unit of W. R. Grace & Co. - Conn.; Dry-Block Mortar Admixture.
    - c. Master Builders, Inc.; Rheomix Rheopel.
    - d. Krete by Krete Industries
- H. Water: Potable.

## 2.7 REINFORCEMENT

- A. Uncoated Steel Reinforcing Bars: ASTM A 615/A 615M or ASTM A 996/A 996M, Grade 60.
- B. Masonry Joint Reinforcement: ASTM A 951; hot-dip galvanized, carbon-steel wire for exterior walls. **Ties shall start at 8" above finish floor.**
1. Wire Size for Side Rods: W1.7 or 0.148-inch diameter.
  2. Wire Size for Cross Rods: W1.7 or 0.148-inch diameter.
  3. Wire Size for Veneer Ties: W1.7 or 0.148-inch diameter.
  4. Spacing of Cross Rods, Tabs, and Cross Ties: Not more than 16 inches o.c.
  5. Single-Wythe Masonry: Truss type with single pair of side rods.
  6. Double-Wythe Masonry: Truss type eye and pintle
  7. Refer to **Details 7, 8, 9 on Sheet G6.1** for more information

## 2.8 TIES AND ANCHORS

- A. Joint Reinforcement, Ties and Anchoring Devices: Comply with requirements indicated below for basic materials and with those indicated under each item.
- B. Hot Dip Galvanized Wire: ASTM A 82 for uncoated wire, ASTM A 123 for zinc coating applied after prefabrication.
1. Wire: Fabricate from 1/4-inch- diameter, hot-dip galvanized steel wire.
- C. Joint Reinforcement: Welded-wire units prefabricated with deformed continuous side rods and plain cross rods into straight lengths of not less than 10' and of widths to fit wall thickness indicated, with prefabricated corner and tee units, and as follows:
1. Wire size for side and cross rods: 0.1483" diameter.
- D. Wire Ties, General: Unless otherwise indicated, size wire ties to extend at least halfway through veneer but with at least 5/8-inch cover on outside face. Outer ends of wires are bent 90 degrees and extend 2 inches parallel to face of veneer.
1. Ties must extend to within 1" of face of veneer masonry.
- E. Adjustable Anchors for Connecting to Structure: Provide anchors that allow vertical or horizontal adjustment but resist tension and compression forces perpendicular to plane of wall.
1. Anchor Section for Welding to Steel Frame: Crimped 1/4-inch- diameter, hot-dip galvanized steel wire.
  2. Tie Section: Triangular-shaped wire tie, sized to extend within 1 inch of masonry face, made from 0.25-inch- diameter, hot-dip galvanized steel wire.
  3. Connector Section for Concrete: Dovetail tabs for inserting into dovetail slots in concrete and attached to tie section; formed from 0.097-inch- thick, steel sheet, galvanized after fabrication.

- F. Partition Top anchors: 0.097-inch- thick metal plate with 3/8-inch- diameter metal rod 6 inches long welded to plate and with closed-end plastic tube fitted over rod that allows rod to move in and out of tube. Fabricate from steel, hot-dip galvanized after fabrication.
- G. Rigid Anchors: Fabricate from steel bars 1-1/2 inches wide by 1/4 inch thick by 24 inches long, with ends turned up 2 inches or with cross pins.
  - 1. Corrosion Protection: Hot-dip galvanized to comply with ASTM A 153/A 153M.
- H. Adjustable Masonry-Veneer Anchors
  - 1. General: Provide anchors that allow vertical adjustment but resist tension and compression forces perpendicular to plane of wall, for attachment over sheathing to wood or metal studs, and as follows:
    - a. Structural Performance Characteristics: Capable of withstanding a 100-lbf load in both tension and compression without deforming or developing play in excess of 0.05 inch.

## 2.9 EMBEDDED FLASHING MATERIALS

- A. Metal Flashing: Provide metal flashing, where flashing is exposed or partly exposed and where indicated, complying with Division 07 Section "Sheet Metal Flashing and Trim."
  - 1. Metal Drip Edges: Fabricate from stainless steel. Extend at least 3 inches into wall and 1/2 inch out from wall, with outer edge bent down 30 degrees and hemmed.
  - 2. Metal Flashing Terminations: Fabricate from stainless steel. Extend at least 3 inches into wall and out to exterior face of wall. At exterior face of wall, bend metal back on itself for 3/4 inch and down into joint 3/8 inch to form a stop for retaining sealant backer rod.
  - 3. Metal Expansion-Joint Strips: Fabricate from stainless steel or copper to shapes indicated.
- B. Flexible Flashing: Refer to Section 04815 Thru Wall Flashing.
- C. Solder and Sealants for Sheet Metal Flashings: As specified in Division 07 Section "Sheet Metal Flashing and Trim."
- D. Adhesives, Primers, and Seam Tapes for Flashings: Flashing manufacturer's standard products or products recommended by flashing manufacturer.

## 2.10 MISCELLANEOUS MASONRY ACCESSORIES

- A. Compressible Filler: Premolded filler strips complying with ASTM D 1056, Grade 2A1; compressible up to 35 percent; formulated from neoprene.
- B. Preformed Control-Joint Gaskets: Made from styrene-butadiene-rubber compound, complying with ASTM D 2000, Designation M2AA-805 and designed to fit standard sash block and to maintain lateral stability in masonry wall.
- C. Bond-Breaker Strips: Asphalt-saturated, organic roofing felt complying with ASTM D 226, Type I (No. 15 asphalt felt).
- D. Weep/Vent Products: Use one of the following, unless otherwise indicated:
  - 1. Rectangular Plastic Weep/Vent Tubing: Clear butyrate, 3/8 by 1-1/2 by 3-1/2 inches long.
  - 2. Cellular Plastic Weep/Vent: One-piece, flexible extrusion made from UV-resistant polypropylene copolymer, full height and width of head joint and depth 1/8 inch less than depth of outer wythe, in color selected from manufacturer's standard.
    - a. Products:
      - 1) Advanced Building Products Inc.; Mortar Maze weep vent.

- 2) Dayton Superior Corporation, Dur-O-Wal Division; Cell Vents.
  - 3) Heckmann Building Products Inc.; No. 85 Cell Vent.
  - 4) Hohmann & Barnard, Inc.; Quadro-Vent.
  - 5) Wire-Bond; Cell Vent.
- E. Cavity Drainage Material: Free-draining mesh, made from polymer strands that will not degrade within the wall cavity.
1. Provide one of the following configurations:
    - a. Strips, full-depth of cavity and 10 inches wide, trapezoidal type system with dovetail shaped notches 7 inches deep.
  2. Products:
    - a. Advanced Building Products Inc.; Mortar Break.
    - b. Archovations, Inc.; CavClear Masonry Mat.
    - c. Dayton Superior Corporation, Dur-O-Wal Division; Polytite MortarStop.
    - d. Mortar Net USA, Ltd.; Mortar Net.

## 2.11 INSULATION

- A. Extruded-Polystyrene Board Insulation: ASTM C 578, Type IV, closed-cell product extruded with an integral skin. Refer to drawings for more application
- B. Injected Foam Insulation: Refer to drawings for more information

## 2.12 MASONRY CLEANERS

- A. ALWAYS TEST a small area of each surface to confirm suitability and desired results before starting overall application. Test with the same equipment, recommended surface preparation and application procedures planned for general application.
- B. Proprietary Acidic Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar/grout stains from new masonry without damaging masonry. Use product approved for intended use by cleaner manufacturer and manufacturer of masonry units being cleaned.
  1. Manufacturers:
    - a. ProSoCo, Inc.
    - b. Diedrich Technologies, Inc.
    - c. EaCo Chem, Inc.
- C. Polished Masonry Units: Clean soiled reflective CMU surfaces only with non-etching type cleaning solution as recommended by ProSoCo, Inc. Follow manufacturer's cleaning instructions. Maintain reflective surface and color.

## 2.13 MORTAR AND GROUT MIXES

- A. General: Do not use admixtures, unless otherwise indicated.
  1. Do not use calcium chloride in mortar or grout.
  2. Limit cementitious materials in mortar for exterior and reinforced masonry to portland cement and lime.
  3. Add cold-weather admixture (if used) at same rate for all mortar that will be exposed to view, regardless of weather conditions, to ensure that mortar color is consistent.
- B. Mortar for Unit Masonry: Comply with ASTM C 270, Proportion Specification.
  1. For masonry below grade or in contact with earth, use Type M.
  2. For reinforced masonry, use Type S.
  3. For mortar parge coats, use Type S or N.

4. For exterior, above-grade, load-bearing and non-load-bearing walls and parapet walls; for interior load-bearing walls; for interior non-load-bearing partitions; and for other applications where another type is not indicated, use Type N.
- C. Pigmented Mortar: Use colored cement product or select and proportion pigments with other ingredients to produce color required. Do not add pigments to colored cement products.
  1. Pigments shall not exceed 10 percent of portland cement by weight.
- D. Grout for Unit Masonry: Comply with ASTM C 476. – Non-Shrink
  1. Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with Table 1.15.1 in ACI 530.1/ASCE 6/TMS 602 for dimensions of grout spaces and pour height.
  2. Provide grout with a slump of 8 to 11 inches as measured according to ASTM C 143/C 143M.

## PART 3 - EXECUTION

### 3.1 INSTALLATION, GENERAL

- A. Perform water test in the cavity once the masonry veneer is at least 16" above the lug or ledge. This is to visually observe if the weeps are open or clogged with debris. This can be an informal test, does not have to be ASTM test, just do not flood the cavity.
- B. Use full-size units without cutting if possible. If cutting is required, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed. Do not install chipped or broken units.
- C. Select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures.
- D. Wetting of Brick: Wet brick before laying if initial rate of absorption exceeds 30 g/30 sq. in. per minute when tested per ASTM C 67. Allow units to absorb water so they are damp but not wet at time of laying.
- E. Comply with tolerances in ACI 530.1/ASCE 6/TMS 602 and with the following:
  1. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2 inch maximum.
  2. For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2 inch maximum.

### 3.2 LAYING MASONRY WALLS

- A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.
- B. Bond Pattern for Exposed Masonry: Unless otherwise indicated, lay exposed masonry in running bond; do not use units with less than nominal 4-inch horizontal face dimensions at corners or jambs.
- C. Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.

- D. Fill space between steel frames and masonry solidly with mortar, unless otherwise indicated.
- E. Fill cores in hollow concrete masonry units with grout 24 inches under bearing plates, beams, lintels, posts, and similar items, unless otherwise indicated.
- F. Loose lay a slip sheet under the loose lintel where they bear on the brick at the jamb conditions.

### 3.3 MORTAR BEDDING AND JOINTING

- A. Lay hollow brick and concrete masonry units as follows:
  - 1. With face shells fully bedded in mortar and with head joints of depth equal to bed joints.
  - 2. With webs fully bedded in mortar in all courses of piers, columns, and pilasters.
  - 3. With webs fully bedded in mortar in grouted masonry, including starting course on footings.
  - 4. With entire units, including areas under cells, fully bedded in mortar at starting course on footings where cells are not grouted.
  - 5. Lay masonry in a full bed of mortar. Do not furrow the joints
  - 6. Do not temper the mortar on the board more than once.
- B. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness, unless otherwise indicated.
- C. Cut joints flush for masonry walls to receive plaster or other direct-applied finishes (other than paint), unless otherwise indicated.

### 3.4 COMPOSITE MASONRY

- A. Bond wythes of composite masonry together using one of the following methods:
  - 1. Masonry Joint Reinforcement: Installed in horizontal mortar joints.
    - a. Where bed joints of both wythes align, use ladder-type reinforcement extending across both wythes.
    - b. Where bed joints of wythes do not align, use adjustable (two-piece) type reinforcement with continuous horizontal wire in facing wythe attached to ties.
- B. Corners: Provide interlocking masonry unit bond in each wythe and course at corners, unless otherwise indicated.
- C. Intersecting and Abutting Walls: Unless vertical expansion or control joints are shown at juncture, bond walls together as follows:
  - 1. Provide continuity with masonry joint reinforcement by using prefabricated T-shaped units.

### 3.5 CAVITY WALLS

- A. Bond wythes of cavity walls together using one of the following methods:
  - 1. Masonry Joint Reinforcement: Installed in horizontal mortar joints.
    - a. Where bed joints of both wythes align, use ladder-type reinforcement extending across both wythes.
    - b. Where bed joints of wythes do not align, use adjustable (two-piece) type reinforcement with continuous horizontal wire in facing wythe attached to ties.
    - c. Where one wythe is of clay masonry and the other of concrete masonry, use adjustable (two-piece) type reinforcement with continuous horizontal wire in



facing wythe attached to ties to allow for differential movement regardless of whether bed joints align.

2. Masonry Veneer Anchors: Comply with requirements for anchoring masonry veneers.
- B. Keep cavities clean of mortar droppings and other materials during construction. Bevel beds away from cavity, to minimize mortar protrusions into cavity. Do not attempt to trowel or remove mortar fins protruding into cavity.
  - C. Installing Cavity-Wall Insulation: Place small dabs of adhesive, spaced approximately 12 inches o.c. both ways, on inside face of insulation boards, or attach with plastic fasteners designed for this purpose. Fit insulation between wall ties and other confining obstructions, with edges butted tightly. Press units firmly against inside wythe of masonry.

### 3.6 MASONRY JOINT REINFORCEMENT

- A. General: Install in mortar with a minimum cover of 5/8 inch on exterior side of walls, 1/2 inch elsewhere. Lap reinforcement a minimum of 6 inches.
- B. Interrupt joint reinforcement at control and expansion joints, unless otherwise indicated.
- C. Provide continuity at wall intersections by using prefabricated T-shaped units.
- D. Provide continuity at corners by using prefabricated L-shaped units.

### 3.7 ANCHORING MASONRY TO STRUCTURAL MEMBERS

- A. Anchor masonry to structural members where masonry abuts or faces structural members to comply with the following:
  1. Provide an open space not less than 1 inch in width between masonry and structural member, unless otherwise indicated.
  2. Anchor masonry to structural members with anchors embedded in masonry joints and attached to structure.
  3. Space anchors as indicated, but not more than 24 inches o.c. vertically and 36 inches o.c. horizontally.

### 3.8 ANCHORING MASONRY VENEERS

- A. Anchor masonry veneers to wall framing with seismic masonry-veneer anchors to comply with the following requirements:
  1. Fasten seismic anchors through sheathing to wall framing and to concrete and masonry backup with metal fasteners of type indicated. Use two fasteners.
  2. Embed connector sections and continuous wire in masonry joints. Provide not less than 2 inches of air space between back of masonry veneer and face of sheathing.
  3. Locate anchor sections to allow maximum vertical differential movement of ties up and down.
  4. Space anchors as indicated, but not more than 16 inches o.c. vertically and 24 inches o.c. horizontally with not less than 1 anchor for each 2.67 sq. ft. of wall area. Install additional anchors within 8 inches of openings and at intervals, not exceeding 16 inches, around perimeter.
  5. Seal around all anchor fasteners with mastic. Inspection to be performed prior to veneer installation.

### 3.9 FLASHING, WEEP HOLES, CAVITY DRAINAGE, AND VENTS

- A. General: Install embedded flashing and weep vents in masonry at shelf angles, lintels, ledges, other obstructions to downward flow of water in wall, and where indicated. Install

vents at shelf angles, ledges, and other obstructions to upward flow of air in cavities, and where indicated.

- B. Install flashing as follows, unless otherwise indicated:
1. Prepare masonry surfaces so they are smooth and free from projections that could puncture flashing. Where flashing is within mortar joint, place through-wall flashing on sloping bed of mortar and cover with mortar. Before covering with mortar, seal penetrations in flashing as recommended by flashing manufacturer.
  2. At lintels and shelf angles, extend flashing a minimum of 8 inches min. (or as necessary to course out with masonry units) into masonry at each end. At heads and sills, extend flashing and provide preformed end dams
  3. Install metal drip edges beneath flexible flashing at exterior face of wall. Stop flexible flashing 1/2 inch back from outside face of wall and adhere flexible flashing to top of metal drip edge.
  4. Install metal flashing termination beneath flexible flashing at exterior face of wall. Stop flexible flashing 1/2 inch back from outside face of wall and adhere flexible flashing to top of metal flashing termination.
- C. Install weep holes in head joints in exterior wythes of first course of masonry immediately above embedded flashing and as follows:
1. Use specified weep/vent products or open head joints to form weep holes.
  2. Space weep holes 24 inches o.c., unless otherwise indicated. Provide a minimum of (2) two over each opening.
  3. Cover cavity side of weep holes with plastic insect screening at cavities insulated with loose-fill insulation.
  4. Weeps shall be installed and seated directly on the flashing below and not on the mortar bed joints.
- D. Place cavity drainage material in cavities to comply with configuration requirements for cavity drainage material.
- E. Install vents in open head joints in exterior wythes at spacing indicated. Use specified weep/vent products or open head joints to form vents.
1. Close cavities off vertically and horizontally with blocking in manner indicated. Install through-wall flashing and weep holes above horizontal blocking.

### 3.10 REINFORCED UNIT MASONRY INSTALLATION

- A. Temporary Formwork and Shores: Construct formwork and shores as needed to support reinforced masonry elements during construction.
1. Construct formwork to provide shape, line, and dimensions of completed masonry as indicated. Make forms sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.
  2. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and other temporary loads that may be placed on them during construction.
- B. Placing Reinforcement: Comply with requirements in ACI 530.1/ASCE 6/TMS 602.
- C. Grouting: Do not place grout until entire height of masonry to be grouted has attained enough strength to resist grout pressure.
1. Comply with requirements in ACI 530.1/ASCE 6/TMS 602 for cleanouts and for grout placement, including minimum grout space and maximum pour height.
  2. Limit height of vertical grout pours to not more than 60 inches.

### 3.11 FIELD QUALITY CONTROL

- A. Inspectors: Owner will engage qualified independent inspectors to perform inspections and prepare reports. Allow inspectors access to scaffolding and work areas, as needed to perform inspections.
  - 1. Place grout only after inspectors have verified compliance of grout spaces and grades, sizes, and locations of reinforcement.
- B. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections indicated below and prepare test reports:
- C. Testing Frequency: One set of tests for each 5000 sq. ft. of wall area or portion thereof.
- D. Clay Masonry Unit Test: For each type of unit provided, per ASTM C 67.
- E. Concrete Masonry Unit Test: For each type of unit provided, per ASTM C 140.
- F. Mortar Test (Property Specification): For each mix provided, per ASTM C 780. Test mortar for mortar air content and compressive strength.
- G. Grout Test (Compressive Strength): For each mix provided, per ASTM C 1019.

### 3.12 PARGING

- A. Parge exterior faces of below-grade masonry walls, in 2 uniform coats to a total thickness of 3/4 inch with a steel-trowel finish. Form a wash at top of parging and a cove at bottom. Damp-cure parging for at least 24 hours and protect parging until cured.

### 3.13 CLEANING

- A. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.
- B. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
  - 1. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes.
  - 2. Protect adjacent surfaces from contact with cleaner.
  - 3. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing surfaces thoroughly with clear water.
  - 4. Clean brick by bucket-and-brush hand-cleaning method described in BIA Technical Notes 20.
  - 5. Clean masonry with a proprietary acidic cleaner applied according to manufacturer's written instructions.
  - 6. Clean concrete masonry by cleaning method indicated in NCMA TEK 8-2A applicable to type of stain on exposed surfaces.

### 3.14 MASONRY WASTE DISPOSAL

- A. Waste Disposal as Fill Material: Dispose of clean masonry waste, including excess or soil-contaminated sand, waste mortar, and broken masonry units, by crushing and mixing with fill material as fill is placed.
  - 1. Do not dispose of masonry waste as fill within 18 inches of finished grade.
  - 2. Remove excess clean masonry waste that cannot be used as fill, as described above, and other masonry waste, and legally dispose of off Owner's property.

END OF SECTION

**DIVISION 5 METALS**  
**05580 MISCELLANEOUS SHEET METALS**

**PART 1 GENERAL**

**1.1 SECTION REQUIREMENTS**

- A. **SUBMITTALS:** In addition to product data, submit the following:
1. Shop drawings showing details of fabrication, assembly, and installation.
  2. Samples, submit 8" square samples of each metal and finish required.

**PART 2 PRODUCTS**

**2.1 MATERIALS/FABRICATION**

- A. **MANUFACTURER:** Subject to compliance with requirements, provide miscellaneous sheet metal products by one of the following:
1. American Steel Products Corp.
  2. Bergen Metal Industries, Inc.
  3. Brandt Airflex Corp.
  4. Custom Enclosures, Inc.
  5. Pioneer Ind. Div., Core Ind. Inc.
- B. **SHEET METAL MATERIALS:** Use materials selected for their surface flatness, smoothness, and freedom from surface blemishes.
- C. **GALVANIZED SHEET STEEL:** ASTM A 526, G90, mill phosphatized.
- D. **SHEET STEEL:** Commercial quality cold-rolled carbon steel as follows:
1. **ZINC-COATED SHEET STEEL:** ASTM A 591, Class C, chemically treated with phosphate solution and light chromate rinse.
  2. **SHEET STEEL:** ASTM A 366, Class 1, matte finish.
- E. **WELDING ELECTRODES AND FILLER METAL:** Type and alloy to match metal to be welded.
- F. **FASTENERS:** Concealed, except as otherwise indicated, of type and alloy to match metal to be fastened; use Phillips flat-head screws for exposed fasteners where permitted, unless otherwise indicated.
- G. **ANCHORS AND INSERTS:** Furnish as required for installation in other work. Use cadmium or hot-dipped galvanized units for exterior work.
- H. **SHOP PRIMER FOR SHEET STEEL:** Manufacturer's standard fast-curing, lead-free, "universal" primer; complying with performance requirements of FS TT-P-645.
- I. **SHOP PRIMER FOR ZINC-COATED SHEET STEEL:** Zinc dust, zinc oxide primer paint complying with FS TT-P-641, Type II.
- J. **SHOP PRIMER FOR ALUMINUM SHEET:** Zinc chromate base complying with FS TT-P-645 or TT-P-1757.
- K. **BAKED ENAMEL FINISH:** Alkyde gloss enamel; FS TT-P-489, Class B.

**PART 3 EXECUTION**

**3.1 FABRICATION**

- A. GENERAL: Fabricate items from materials of type, gauge and finish and to dimensions and details indicated, or required to provide unit of strength required for intended use and to produce exposed surface which are smooth, flat and free of imperfections.
- B. Form sheet metal in maximum lengths and keep joints to a minimum, with cut edges concealed.
- C. Continuously weld all joints and seams except as otherwise indicated.
- D. Conform to SMACNA recommendations for fabrication and construction details except as otherwise indicated.
- E. FILLER PANELS: Sheet steel, 16 gauge, with mineral fiber core, and compressible gaskets or mastic sealing tape at all edges.
- F. HEATING-COOLING ENCLOSURES: Steel sheet with louvers and grilles, removable tops and fronts, hinges across panels, sound deadening, built-in partitions (bulkheads) within enclosures at partition ends and window mullions; design and fabricate to support design load of 200 lbs. per square foot or 150 lbs. per linear foot, whichever is greater.
- G. SHOP FINISHING: Comply with NAAMM "Metal Finishes Manual", to produce uniformly finished products, and for sheet steel, with SSPC-PA1.
- H. COLORS: Provide colors indicated or, if not indicated, as selected by Architect from manufacturer's standard colors.
- I. CLOSINGS AND TRIM: Sheet steel, 18 gauge, formed to tightly close with adjoining work.
- J. Provide gaskets of closed-cell neoprene or mastic sealing tape for continuous seal to abutting surfaces.

### 3.2 SHEET STEEL FINISH

- A. SURFACE PREPARATION AND PAINTING: Solvent-clean surfaces to comply with SSPC- SP1. Remove mill scale and rust, if present, to comply with SSPC-SP5 (white Metal Blast Cleaning) or SSPC-SP8 (pickling). For uncoated sheet steel, apply hot phosphate surface treatment to comply with SSPC-PT4
- B. Apply shop primer to uncoated sheet steel immediately following surface preparation and pretreatment.
- C. Apply shop primer to zinc-coated sheet steel immediately after surface preparation.
- D. Apply baked enamel finish system to sheet to comply with paint manufacturer's specifications.

### 3.3 INSTALLATION

- A. LOCATE AND PLACE: Locate and place miscellaneous sheet metal items plumb and level; in proper alignment with, and securely attached to, adjoining work.
- B. PROTECT ALUMINUM SURFACES: Protect aluminum surfaces from corrosion where in contact with dissimilar metals, concrete or masonry by coating contact surfaces with zinc chromate primer or bituminous paint.
- C. TOUCH-UP: Touch-up shop painted surfaces after installation, using same materials used in shop.

END OF SECTION

**DIVISION 6 WOOD AND PLASTICS**  
**06100 ROUGH CARPENTRY**

PART 1 GENERAL

1.1 SUMMARY

- A. This section includes the following:
  - 1. Wood blocking, cants, and nailers
  - 2. Wood furring and grounds
  - 3. Plywood backing panels
- B. Related sections include the following:
  - 1. Division 2 Section 02282 Termite Control

1.2 SUBMITTALS

- A. Submit product data for each type or process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.
- B. Include data for insulating sheathing under-layment.

PART 2 PRODUCTS

2.1 LUMBER, GENERAL

- A. Manufacture lumber, S4S and grade-stamped, to comply with PS20 and applicable grading rules of inspection agencies certified by ALSC's Board of Review.
  - 1. Unseasoned lumber is not acceptable.
  - 2. For exposed lumber, apply grade stamps to ends of back of each piece or omit grade stamps entirely and issue certificate of grade compliance.
- B. STUDS: 2x4, 2x6, 2x8 treated lumber. Nailers as recommended by manufacturer.
- C. LUMBER FOR MISCELLANEOUS USES: Standard grade lumber for support of other work.
- D. CONSTRUCTION PANELS: For types of concealed applications indicated below, provide wood panel products complying with PS 1 where applicable, and with "APA Performance Standard and Policies for Structural Use Panels (Form E445) for requirements indicated.
  - 1. For following types of applications where exposure durability classification or span rating is not given, provide EXPOSURE 1 and rating required to suit support spacing indicated.
    - a) COMBINATION SUBFLOOR-UNDERLAYMENT: APA rated STURD-I-FLOOR.
    - b) SUBFLOORING: APA rated sheathing.
    - c) WALL SHEATHING: APA rated sheathing.
    - d) ROOF SHEATHING: APA rated sheathing
- E. PLYWOOD BACKING FOR ELECTRICAL AND TELEPHONE EQUIPMENT: APA C-D plugged INT with exterior glue, fire-retardant treated, 1/2" thick except as otherwise indicated.
- F. HARDBOARD UNDERLAYMENT: 4'x4' panels complying with ANSI A135.4, Class 4 (service), Surface S1S, sanded on back side to uniform thickness of 0.215" OR 0.200", as standard with manufacturer, + - 0.005".

- G. POLYSTYRENE BOARD SHEATHING: ASTM C 578, type IV, 4'x8', thickness as indicated on plans.
- H. POLYISOCYANURATE BOARD SHEATHING: FS HH-I-1972, class as indicated below in thickness indicated:
  - 1. Class 1: Un-reinforced core, aluminum foil both sides.
  - 2. Class 2: Glass-fiber reinforced core.
- I. GYPSUM SHEATHING: ASTM C 79, FS SS-L-30, Type II, class 2, form A and complying with the following requirements.
  - 1. GRADE W: Water-resistant treated core, 1/2" thick.
  - 2. GRADE X: Fire-resistant treated core, 5/8" thick.
  - 3. SIZE: 2' x 8', V-T&G long edges; 4'x8', square edges.
- J. BUILDING PAPER: Asphalt saturated felt, non-perforated ASTM D 226.

## 2.2 FASTENERS AND ANCHORS

- A. Of size, type, material and finish suited to application shown. Provide metal hangers and framing anchors of size and type recommended for intended use by manufacturer. Hot-dip galvanized fasteners and anchors for work exposed to weather, in ground contact and high relative humidity to comply with ASTM A 153.

## 2.3 PRESERVATIVES

- A. Preservatives pressure treat lumber and plywood with water-borne preservatives to comply with AWPA C2 and C9, respectively, and with requirements indicated below:
  - 1. WOOD FOR GROUND CONTACT USE: AWPB LP-22.
  - 2. WOOD FOR ABOVE-GROUND USE: AWPB LP-2.

## 2.4 TREATMENT

- A. Treat Cants, nailers, blocking, stripping, and similar items in conjunction with roofing, flashing, vapor barriers, and water proofing.
- B. Treat sills, sleepers, blocking, furring, and other wood in direct contact with concrete or masonry.

## PART 3 EXECUTION

### 3.1 INSTALLATION, GENERAL

- A. ROUGH CARPENTRY: Install rough carpentry work to comply with "Manual of House Framing" by National Forest Products Assoc. (N.F.P.A.) and with recommendation of American Plywood Assoc. (APA), unless otherwise indicated. For sheathing, underlayment and other products not covered in above standards, comply with recommendations of manufacturer of product involved for use intended. Set carpentry work to required levels and lines, with members plumb and true and cut to fit.
- B. FIRE-RETARDANT TREATED WOOD: Where wood is indicated for fire-retardant treatment comply with AWPA C20 (lumber) and AWPA C27 (plywood) for treatment type indicated below. Provide label of UL or other testing or inspection agency acceptable to authorities having jurisdiction on each piece treated. Redry treated lumber.
  - 1. INTERIOR TYPE A: Use where "FRTW" wood is indicated on interior.

2. EXTERIOR TYPE: Use where "FRTW" is indicated for exterior exposed applications.

### 3.2 ATTACHMENT

- A. Securely attach carpentry work to substrates and supporting members using fasteners of size that will not penetrate members where opposite side will be exposed to view or receive finish materials. Install fasteners without splitting wood; fasten panel products to allow for expansion at joints unless otherwise indicated.

### 3.3 FRAMING MEMBERS

- A. Provide wood framing members of size and spacing indicated; do not splice structural members between supports. Fire stop concealed spaces with wood blocking not less than 2" thick, if not blocked by other framing members.

### 3.4 BLOCKING

- A. Provide wood blocking not less than 1-1/2" thick and 3-1/2" wide to support cabinets, grab bars, towel bars, etc., and any other items attached to finished wall.

### 3.5 PROTECTION

- A. Protect rough carpentry from weather. If despite protection, rough carpentry becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA – registered label.

END OF SECTION



**DIVISION 6 WOOD AND PLASTICS**  
**06200 FINISH CARPENTRY**

**PART 1 GENERAL**

**1.1 SUMMARY**

- A. This section includes the following:
  - 1. Wood cabinets
  - 2. Shop finishing of interior woodwork

**1.2 SUBMITTALS**

- A. Product Data: For each type of product (millwork and factory-fabricated items) indicated, including cabinet hardware and accessories and finishing materials and processes.
  - 1. Samples: Submit for lumber machined to stock and custom patterns, and Plywood for transparent finish.
- B. Shop Drawings: Show location of each item, dimensioned plans and elevations, large scale details, attachment devices, and other components.
  - 1. Show details full size
  - 2. Show locations and sizes of furring, blocking, and hanging strips, including concealed blocking and reinforcement specified in other Sections.
  - 3. Show locations and sizes of cutouts and holes for plumbing fixtures, faucets, soap dispensers, and other items installed in millwork
  - 4. Show veneer leaves with dimensions, grain direction, exposed face, and identification numbers indicating the flitch and sequence within the flitch for each leaf.
- C. Product Certificates: For each type of product, signed by product manufacturer
- D. Woodwork Quality Standard Compliance Certificates: AWI Quality Certification Program Certificates.
- E. Qualification data: for Installer

**PART 2 PRODUCTS**

**2.1 MATERIALS**

- A. Provide interior and exterior lumber materials that comply with requirements of AWI's quality standard for each type of woodwork and quality grade specified, unless otherwise specified on drawings.
- B. MOISTURE CONTENTS:
  - 1. Softwood: not to exceed 12%
  - 2. Hardwood: not to exceed 6%
- C. EXTERIOR LUMBER: Refer to drawings for more information
- D. INTERIOR LUMBER:
  - 1. Wood Base: Refer to Room Finish Schedule
  - 2. Door Frame
  - 3. Door Casing:
  - 4. Door: As per Wood Doors specifications
  - 5. Shelving: Birch Plywood, FAS grade exposed 2 sides, FAS grade with one side exposed. Sand exposed surfaces and provide solid birch banded edges.

## 2.2 HARDWARE

- A. The contractor shall furnish and install all nails, screws, and finish hardware required in the assembling and securing of his work.
- B. CABINET HARDWARE:
  - 1. Drawers - One pair Knap & Vogt 1275 drawer end slides per drawer or approved equal.
  - 2. Hinges - One pair Jay Bee/Ajax Pivot Hinge No.233 per drawer. Color selected by Architect.
  - 3. Pulls - Jay Bee/Ajax 4" center Metro Pull one per door and drawer. Color selected by Architect.
  - 4. Adjustable Shelves- Knap & Vogt 255 steel standards with 256 supports or equal.
- C. OTHER HARDWARE:
  - 1. Sliding Glass Doors- Knap & Vogt 992ZC assembly or equal.
  - 2. Closet rod supports- Knap & Vogt 1195. Quantity-as required, but spans shall not exceed 4'-0".
  - 3. Mirror Clips- Knap & Vogt 6092 or equal. Quantity-as required for size and weight of mirror(s) shown.
  - 4. **Provide Knap & Vogt locks at all drawers and cabinet doors.**

## 2.3 CABINETS AND COUNTERS

- A. LAMINATED PLASTIC: High pressure plastic laminate to meet or exceed NEMA premiums as manufactured by Wilsonart, Formica, or an approved equal. Colors shall be selected during submittals phase. **N/A**  
**REFER TO SECTION 06650 SOLID SURFACE FABRICATIONS**
- B. ADHESIVE: Waterproof type as recommended by plastic manufacturer for type of use:
  - Sub-tops - 3/4" Plywood INT-DFPA-A-A
  - Plywood - Exposed 2 sides - INT-DFPA-A-A
  - Exposed 1 side - INT-DFPA-A-D
  - Framing – grade #1 or better Birch
  - Drawers – grade #1 or better Birch
  - Shelving - 3/4" plywood with solid birch edging.

## PART 3 EXECUTION

### 3.1 INSTALLATION:

- A. INSPECTIONS: Inspect finish materials, trim doors, etc. to insure that no sub-grade, defective, or machine marked pieces are installed.
- B. PAINTING, BACKPAINTING, AND TRANSPARENT FINISH: Arrange to have all doors, interior finish cabinet work, miscellaneous trim, etc. primed, back painted, or stained and varnished immediately upon delivery to the building.
- C. NAILING: Interior wood trim less than 4" wide, 6d casing nails not more than 12" o. c. staggered. Wider than 4", 2-6d casing nails 12"o.c.

### 3.2 DELIVERY, STORAGE AND PROTECTION:

- A. Protect millwork, cabinetwork, hardware, etc. against damage, water moisture, and extreme temperature. Any damaged items shall be cause to reject said items at the

contractor's expense.

- B. FINISH HARDWARE: The supplier will mark each item of hardware for location. If hardware is delivered unmarked, return to supplier for marking.
- C. Provide cleaned, properly sized and accurately placed mortises and drilled holes for all mortise hardware such as lock sets and for cylindrical locks where specified only. Any damaged, abused, or improperly adjusted hardware shall be replaced by the contractor at his own expense.
- D. Fit all surfaces applied hardware accurately, install, and make necessary adjustments for proper working order. Protect hardware by the use of heavy paper and masking tape and maintain until job is completed.

END OF SECTION

**DIVISION 6 WOOD AND PLASTICS**  
**SECTION 06650 - SOLID SURFACING**

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the contract, including general and supplementary conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following horizontal and trim solid surface product types:
1. Countertops at concession
  2. Cove backsplashes
  3. Window Sills
- B. Related Sections include the following:
1. Finish Carpentry: Section 06200.
  2. Sealants: Section 07900.
  3. Plumbing: Division 15.

1.3 DEFINITION

- A. Solid surface is defined as nonporous, homogeneous material maintaining the same composition throughout the part with a composition of acrylic polymer, aluminum trihydrate filler and pigment.

1.4 SUBMITTALS

- A. Product data:
1. For each type of product indicated.
  2. Product data for the following:
    - a. Chemical-resistant tops
- B. Shop drawings:
1. Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices and other components.
    - a. Show full-size details, edge details, thermoforming requirements, attachments, etc.
    - b. Show locations and sizes of furring, blocking, including concealed blocking and reinforcement specified in other Sections.
    - c. Show locations and sizes of cutouts and holes for plumbing fixtures, faucets, soap dispensers, waste receptacle and other items installed in solid surface.
- C. Product data:
1. Indicate product description, fabrication information and compliance with specified performance requirements.
- D. Fabricator/installer qualifications:
1. Provide copy of certification number.
- E. Manufacturer certificates:
1. Signed by manufacturers certifying that they comply with requirements.
- F. NSF/ANSI standards:

1. Refer to [www.nsf.org](http://www.nsf.org) for the latest compliance to NSF/ANSI Standard 51 for food zone — all food types.

G. Maintenance data:

1. Submit manufacturer's care and maintenance data, including repair and cleaning instructions.
  - a. Maintenance kit for finishes shall be submitted.
2. Include in project closeout documents.

## 1.5 QUALITY ASSURANCE

A. Qualifications:

1. Shop that employs skilled workers who custom fabricate products similar to those required for this project and whose products have a record of successful in-service performance.

B. Fabricator/installer qualifications:

1. Work of this section shall be by a certified fabricator/installer, certified in writing by the manufacturer.

C. Applicable standards:

1. Standards of the following, as referenced herein:
  - a. American National Standards Institute (ANSI)
  - b. American Society for Testing and Materials (ASTM)
  - c. National Electrical Manufacturers Association (NEMA)
  - d. NSF International
2. Fire test response characteristics:
  - a. Provide with the following Class A (Class I) surface burning characteristics as determined by testing identical products per UL 723 (ASTM E84) or another testing and inspecting agency acceptable to authorities having jurisdiction:
    - 1) Flame Spread Index: 25 or less.
    - 2) Smoke Developed Index: 450 or less.

## 1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver no components to project site until areas are ready for installation.
- B. Store components indoors prior to installation.
- C. Handle materials to prevent damage to finished surfaces.
  1. Provide protective coverings to prevent physical damage or staining following installation for duration of project.

## 1.7 WARRANTY

- A. Provide manufacturer's warranty against defects in materials.
  1. Warranty shall provide material and labor to repair or replace defective materials.
- B. Manufacturer's warranty period:
  1. Ten years from date of substantial completion.

## 1.8 MAINTENANCE

- A. Provide maintenance requirements as specified by the manufacturer.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers:

1. Subject to compliance with requirements, provide products by one of the following:
  - a. LG Hausys Hi-Macs
  - b. Corian® surfaces from the DuPont company
  - e. or approved equal

2.2 MATERIALS

A. Solid polymer components

1. Cast, nonporous, filled polymer, not coated, laminated or of composite construction with through body colors meeting ANSI Z124.3 or ANSI Z124.6, having minimum physical and performance properties specified.
2. Superficial damage to a depth of 0.010 inch (.25 mm) shall be repairable by sanding and/or polishing.

B. Thickness:

1. 1/2 inch

C. Edge treatment:

1. Full Bullnose
2. Square edge for window sills

D. Backsplash:

1. Applied.

E. Sidesplash:

1. Applied.

F. Performance characteristics:

Property	Typical Result	Test
Tensile Strength	6,000 psi	ASTM D 638
Tensile Modulus	1.5 x 10 <sup>6</sup> psi	ASTM D 638
Tensile Elongation	0.4% min.	ASTM D 638
Flexural Strength	10,000 psi	ASTM D 790
Flexural Modulus	1.2 x 10 <sup>6</sup> psi	ASTM D 790
Hardness	>85	Rockwell "M" Scale
	56	ASTM D 785 Barcol Impressor
		ASTM D 2583
Thermal Expansion	3.02 x 10 <sup>-5</sup> in./in./°C (1.80 x 10 <sup>-5</sup> in./in./°F)	ASTM D 696
Gloss (60° Gardner)	5–75 (matte—highly polished)	ANSI Z124
Light Resistance	(Xenon Arc) No effect	NEMA LD 3-2000 Method 3.3
Wear and Cleanability	Passes	ANSI Z124.3 & Z124.6
Stain Resistance: Sheets	Passes	ANSI Z124.3 & Z124.6
Fungus and Bacteria Resistance	Does not support microbial growth	ASTM G21&G22
Boiling Water Resistance	No visible change	NEMA LD 3-2000

High Temperature Resistance	No change	Method 3.5 NEMA LD 3-2000
Izod Impact (Notched Specimen)	0.28 ft.-lbs./in. of notch	Method 3.6 ASTM D 256 (Method A)
Ball Impact Resistance: Sheets	No fracture—1/2 lb. ball: 1/4" slab—36" drop 1/2" slab—144" drop	NEMA LD 3-2000 Method 3.8
Weatherability	$\Delta E^*_{94} < 5$ in 1,000 hrs.	ASTM G 155
Specific Gravity †	1.7	
Water Absorption	Long-term 0.4% (3/4") 0.6% (1/2") 0.8% (1/4")	ASTM D 570
Toxicity	99 (solid colors) 66 (patterned colors)	Pittsburgh Protocol Test ("LC50" Test)
Flammability	All colors (Class I and Class A)	ASTM E 84, NFPA 255 & UL 723
Flame Spread Index	<25	
Smoke Developed Index	<25	

† Approximate weight per square foot: 1/4" (6 mm) 2.2 lbs., 1/2" (12.3 mm) 4.4 lbs.  
Shapes meet or exceed the ANSI Z124.3 and ANSI Z124.6 standards for plastic sinks and lavatories.

NEMA results based on the NEMA LD 3-2000

## 2.3 ACCESSORIES

### A. Joint adhesive:

1. Manufacturer's standard one- or two-part adhesive kit to create inconspicuous, nonporous joints.

### B. Sealant:

1. Manufacturer's standard mildew-resistant, FDA-compliant, NSF 51-compliant (food zone — any type), UL-listed silicone sealant in colors matching components.

### D. Conductive tape:

1. Manufacturer's standard aluminum foil tape, with required thickness, for use with cutouts near heat sources.

### E. Insulating felt tape:

1. Manufacturer's standard for use with conductive tape in insulating solid surface material from adjacent heat source.

## 2.4 FACTORY FABRICATION

### A. Shop assembly

1. Fabricate components to greatest extent practical to sizes and shapes indicated, in accordance with approved shop drawings and manufacturer's printed instructions and technical bulletins.
2. Form joints between components using manufacturer's standard joint adhesive without conspicuous joints.
  - a. Reinforce with strip of solid polymer material, 2" wide.

3. Provide factory cutouts for plumbing fittings and bath accessories as indicated on the drawings.
4. Rout and finish component edges with clean, sharp returns.
  - a. Rout cutouts, radii and contours to template.
  - b. Smooth edges.
  - c. Repair or reject defective and inaccurate work.

## 2.5 FINISHES

- A. Color:
  - a. **CONCRETE GRAY S103 by LG Hausys HI-MACS or approved equal**
- B. Finish:
  1. Provide surfaces with a uniform finish.
    - a. Matte; gloss range of 5–20.

## PART 3 — EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates and conditions, with fabricator present for compliance with requirements for installation tolerances and other conditions affecting performance of work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

- A. Install components plumb, level and rigid, scribed to adjacent finishes, in accordance with approved shop drawings and product data.
  1. Provide product in the largest pieces available.
  2. Form field joints using manufacturer's recommended adhesive, with joints inconspicuous in finished work.
    - a. Exposed joints/seams shall not be allowed.
  3. Reinforce field joints with solid surface strips extending a minimum of 1 inch on either side of the seam with the strip being the same thickness as the top.
  4. Cut and finish component edges with clean, sharp returns.
  5. Rout radii and contours to template.
  6. Anchor securely to base cabinets or other supports.
  7. Align adjacent countertops and form seams to comply with manufacturer's written recommendations using adhesive in color to match countertop.
  8. Carefully dress joints smooth, remove surface scratches and clean entire surface.
  9. Install countertops with no more than 1/8-inch (3 mm) sag, bow or other variation from a straight line.
- B. Coved backsplashes and applied sidesplashes:
  1. Install applied sidesplashes using manufacturer's standard color-matched silicone sealant.
  2. Adhere applied sidesplashes to countertops using manufacturer's standard color-matched silicone sealant.
- C. Coved backsplashes and sidesplashes:
  1. Provide coved backsplashes and sidesplashes at all walls and adjacent millwork.
  2. Fabricate radius cove at intersection of counters with backsplashes to dimensions shown on the drawings.



3. Adhere to countertops using manufacturer's standard color-matched Joint Adhesive.

### 3.3 REPAIR

- A. Repair or replace damaged work which cannot be repaired to architect's satisfaction.

### 3.4 CLEANING AND PROTECTION

- A. Keep components clean during installation.
- B. Remove adhesives, sealants and other stains.

END OF SECTION

## **DIVISION 7 THERMAL AND MOISTURE PROTECTION**

### **07210 BUILDING INSULATION**

*(provide only non-asbestos products)*

#### PART 1 GENERAL

##### 1.1 WORK INCLUDED

- A. Exterior Walls
- B. Ceiling Insulation

##### 1.2 PRODUCT HANDLING

- A. PROTECTION: Deliver to site; store in dry place with labels intact. Protect materials before, during, and after installation. Protect installed work of other trades.
- B. REPLACEMENTS: In event of damage, make necessary repairs and replacements.

#### PART 2 PRODUCTS

##### 2.1 BUILDING INSULATION

- A. Insulation shall be the product indicated or an equal approved in advance by the Architect. Location and type of each insulation listed below re: to Drawings.
  - 1. RIGID WALL INSULATION: Refer to section 07211 – Board Insulation
  - 2. WALL INSULATION: Wall injected foam in CMU, from finish floor to top of wall.
  - 3. CEILING INSULATION: Owens- Corning, R-19, craft paper unless otherwise indicated.
  - 4. METAL BUILDING INSULATION: Specified in section 13120, Pre-Engineered Structures (by pre-engineered building supplier).

##### 2.2 SEALANTS

- A. The following sealants shall be used unless otherwise specified.
  - 1. Silicone Foam: Dow Corning Fire Stop Foam. (non-asbestos)
  - 2. Caulk: 3M, Fire Barrier CP-25.

##### 2.3 MASTIC

- A. Provide mastic for rigid wall insulation as recommended by manufacturer.

##### 2.4 OTHER MATERIALS

- A. Fasteners, retainers or other materials not specifically described shall be as selected by Contractor and approved by Architect.

#### PART 3: EXECUTION

##### 3.1 SURFACE CONDITIONS

- A. INSPECTION: Prior to work of this Section, inspect installed work and verify that this installation may properly commence.

1. Verify that insulation may be installed in accordance with original design and manufacturer's recommendations.

B. DISCREPANCIES: In event of discrepancy, notify Architect.

1. Do not proceed until discrepancies have been resolved.

### 3.2 INSTALLATION:

A. GENERAL: Install insulation in accordance with manufacturer's current edition of insulation application instructions.

B. Install safing insulation and/or sealant at all fire wall penetrations of structural members, control joints, expansion joints, openings, etc. and as indicated on drawings in accordance with local code authority.

### 3.3 INSPECTION

A. Verify that all insulation work is properly installed and complete.

END OF SECTION

**DIVISION 7 THERMAL AND MOISTURE PROTECTION**  
**07211 BOARD INSULATION**

PART 1 GENERAL

1.1 SUMMARY

- A. Materials of This Section: Provide thermal protection to air seal materials at building enclosure elements in conjunction with air barrier materials in Section 07272.

1.2 SUBMITTALS

- A. Section 01340 – Submittal Procedures.
- B. Product Data: Submit data on product characteristics, performance criteria, limitations and adhesives.
- C. Manufacturer's Certificate: Certify products meet or exceed specified requirements and are suitable for the use intended. Certify adhesive is compatible with air/water membrane specified.
- D. Warranty: Provide manufacturer's 20-year thermal performance warranty.
- E. Provide written certification from the manufacturer of the board insulation stating that the board insulation is compatible with the fluid applied membrane air barrier system specified in Section 07272.

1.3 ENVIRONMENTAL REQUIREMENTS

- A. Do not install adhesives when temperature or weather conditions are detrimental to successful installation.

1.4 SEQUENCING

- A. Sequence Work to ensure air barrier materials are in place before beginning work of this section.

1.5 COORDINATION

- A. Coordinate Work with Section 07272 for air barrier materials. Board adhesive shall be compatible with air barrier materials.

1.6 QUALITY ASSURANCE

- A. Sustainable Product Characteristics:
  - 1. Must Be Greenguard Certified for Indoor Air Quality
  - 2. Must be 3<sup>rd</sup> party Certified for = > 15% recycled content
  - 3. Must have > 60% less Global Warming Potential
  - 4. Must be 100% recyclable
  - 5. Must have 0 ozone depletion
    - a. Source Limitations: Obtain building insulation through one source from a single manufacturer.
    - b. Fire-Test-Response Characteristics: Provide insulation possessing the surface burning characteristics indicated, determined by testing identical products in accordance with test method ASTM E 84.
    - c. Thermal Resistance: Shall be 5-year aged R-value determined by testing in

accordance with test method ASTM C518.

- d. Testing and Labeling: Shall be by Underwriters Laboratories or another testing and labeling agency acceptable to authorities having jurisdiction. All insulation shall be indentified with appropriate markings of applicable testing and inspecting agency.

## 1.7 PRODUCT HANDLING

- A. Protect insulation from physical damage.
- B. Comply with manufacturer's recommendations for handling, storage and protection.
  1. Do not expose to sunlight, except to extent necessary for period of installation and concealment.
  2. Protect against ignition at all times. Do not deliver plastic insulating materials to Project site before installation time.
  3. Complete installation and concealment of plastic materials as rapidly as possible in each area of construction.
  4. When installing black/dark (non-white) tapes and/or waterproofing/air barrier membranes over extruded polystyrene insulation, avoid prolonged sun exposure of such surfaces. Provide daily final finish covering or temporary white opaque covering over black/dark (non-white) surfaces to avoid possible solar heat damage.
- C. Handle boards carefully so that corners are not broken off or boards otherwise damaged. Damaged boards shall not be permitted to be installed.

## 1.8 WARRANTY

- A. Provide written warranty that the actual thermal resistance of the extruded polystyrene insulation will not vary by more than 10% from its published thermal resistance.
- B. Warranty period is 20 years from the date insulation is purchased.

## PART 2 PRODUCTS

### 2.1 BOARD INSULATION

- A. Manufacturer:
  1. Owens Corning Foamular– Extruded-Polystyrene Insulation, Model CW-25 Insulation.
  2. Substitutions: Products, which comply with this Section, may be submitted from the following manufacturer's:
    - a. Dow Chemical Styrofoam

### 2.2 COMPONENTS

- A. Rigid Closed-Cell Extruded Polystyrene Insulation: ASTM C578-95 Type IV conforming to the following:
  1. Board Density: 1.6 lb/cu ft min.
  2. Board Size: 16 x 96 inch
  3. Board Thickness: 2 inches
  4. Thermal Resistance: R-10; 5-year aged R-values of 5.4 and 5.0 min. degrees F-ft sq.-h/Btu/inch at 40 degrees F and 75 degrees F respectively. ASTM C518-91.
  5. Water Absorption: Max 0.1% by volume. ASTM C272-91.
  6. Compressive Strength: Minimum 25 psi. ASTM D1621-94.

7. Board Edges: Square edges.
8. Flame/Smoke Properties: 5/165 in accordance with ASTM E84.

## 2.3 ACCESSORIES

- A. Adhesive: Type recommended by insulation manufacturer for application. Adhesive shall be compatible with air barrier membrane.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Verify substrate, adjacent materials, and insulation boards are dry and ready to receive insulation and adhesive.
- B. Verify substrate surface is flat, free of irregularities, materials or substances affecting adhesive bond.

### 3.2 INSTALLATION – CAVITY WALLS

- A. Install boards horizontally.
- B. Press units firmly against inside wythe of glass-faced sheathing, concrete block back-up or concrete wall surfaces. Stagger joints. Make insulation continuous. Fill all voids.
  1. Place pads of LT-100 (STS Coatings [830-995-5177]) construction adhesive spaced approximately 24 inches o.c. both ways on inside face of insulation board, or as recommended by the adhesive manufacturer. Construction adhesive must be recommended by its manufacturer for use with polystyrene rigid board insulation and compatible with air barrier membrane. Fit courses of insulation between wall ties and other obstructions, with edges butted tightly in both directions. Press units firmly against inside substrates indicated.
- C. Cut and fit insulation tight to protrusions or interruptions to insulation plane.
- D. Coordinate placement of insulation with location of masonry and or stone veneer anchors.

### 3.3 PROTECTION OF INSTALLED CONSTRUCTION

- A. Section 01010 – Summary of work: Protecting installed construction.
- B. Do not permit work to be damaged prior to covering insulation.

END OF SECTION

**DIVISION 7 THERMAL AND MOISTURE PROTECTION**  
**07272 FLUID-APPLIED VAPOR PERMEABLE MEMBRANE AIR BARRIER SYSTEM ASSEMBLY**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Materials and installation methods supplementing a one-component vapor permeable, liquid applied, elastic air, and water barrier, vapor retarder materials and assemblies.
- B. Materials and installation to bridge and seal the following air leakage pathways and gaps:
  - 1. Connections of the walls to the roof air barrier.
  - 2. Connections of the walls to the foundations.
  - 3. Expansion joints.
  - 4. Openings and penetrations of window frames, store front, curtain wall.
  - 5. Barrier precast concrete and other envelope systems.
  - 6. Door frames.
  - 7. Piping, conduit, duct and similar penetrations.
  - 8. Masonry ties, screws, bolts and similar penetrations.
  - 9. All other air leakage pathways in the building envelope.
  - 10. Sealing flashing to wall surface.

1.02 RELATED SECTIONS

- A. Section 04200 Unit Masonry: Flexible through wall flashing membrane. Sealing flashing to wall surface.
- B. Section 06100 – Rough Carpentry: Covering preservative-treated materials with self-adhering membranes.
- C. Section 09250 – Gypsum Sheathing: Installing air barrier membrane over glass-faced gypsum sheathing and structural roof decking and roof board.
- D. Section 07900 – Joint Protection: Sealants.

1.03 PERFORMANCE REFERENCES

- A. ASTM E 2178-01: Standard Test for Determining the Air Permeability of Building Materials.
- B. ASTM E 2357, Standard Test Method for Determining Air Leakage of Air Barrier Systems (**Full Scale Wall Testing of the Air Barrier System**). Ensure tests were conducted on steel stud frame walls with penetrations (Specimen 2) as some air barrier systems are not tested in that critical mode.
- C. ASTM E283-91: Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
- D. ASTM E330-90: Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.

- E. ASTM E96: Water Vapor Transmission of Materials, Procedure B
- F. AATCC 127 Water Resistance
- G. ASTM D 1970, Self Sealability
- H. ICC-ES AC212, Freeze Thaw, Crack Bridging
- I. Fire Testing: Air Barrier, as a component of a wall assembly, shall have passed a NFPA 285 complete wall fire test.
- J. **Listed as an evaluated system by Air Barrier Association of America at [www.airbarriers.org/materials/assemblies\\_e.php](http://www.airbarriers.org/materials/assemblies_e.php)**

#### 1.04 PERFORMANCE REQUIREMENTS

- A. Provide an air barrier system constructed to perform as a continuous elastic air barrier, and as a liquid water drainage plane flashed to discharge to the exterior any incidental condensation or water penetration. Membrane shall accommodate movements of building materials by providing expansion and control joints as required, with accessory air seal materials at such locations, changes in substrate and perimeter conditions.
  - 1. The air barrier shall have the following characteristics:
    - a. It must be continuous, with all joints made air-tight.
    - b. It shall be capable of withstanding positive and negative combined design wind, fan and stack pressures on the envelope without damage or displacement, and shall transfer the load to the structure. It shall not displace adjacent materials under full load. The air barrier shall be joined in an airtight and flexible manner to the air barrier material of adjacent systems, allowing for the relative movement of systems due to thermal and moisture variations and creep. Connection shall be made between:
      - 1) Foundation and walls.
      - 2) Walls and windows or doors.
      - 3) Different wall systems.
      - 4) Wall and roof.
      - 5) Wall and roof over unconditioned space.
      - 6) Walls, floor and roof across construction, control and expansion joints.
      - 7) Walls, floors and roof to utility, pipe and duct penetrations.
      - 8) Flashing to wall surface.
  - 2. All penetrations of the air barrier and paths of air infiltration/exfiltration shall be made air-tight.
  - 3. Air Permeability: Maximum 0.04 cfm/sq.ft. @ 10.5 psf per ASTM E283.
  - 4. Air Permeability: @ delta P of 0.3 inches water...0.002 CFM/ft<sup>2</sup> per ASTM E 2178
  - 5. ASTM E 2357, Full Scale Wall Testing of the Air Barrier System
    - a. System Air Leakage, Requirement – 0.0008 CFM/ft<sup>2</sup> maximum
    - b. Penetration Check, Requirement – 0.00088 CFM/ft<sup>2</sup> maximum
  - 6. ASTM E96 Water Vapor Permeance: 10-20 perms per Procedure B
  - 7. Elongation: Minimum 75% per ASTM D412.
  - 8. AATC 127 Water Resistance – Pass
  - 9. ASTM D 1970 Self Sealability – Pass
  - 10. ICC-ES AC212, Freeze Thaw, Crack Bridging – Pass



11. Fire Testing: Air Barrier, as a component of a wall assembly, shall have passed a NFPA 285 complete wall fire test.
12. **Listed as an evaluated assembly by the Air Barrier Association at [www.airbarriers.org/materials/assemblies\\_e.php](http://www.airbarriers.org/materials/assemblies_e.php)**

#### 1.05 SUBMITTALS

- A. Section 01340 – Shop Drawings & Data Samples: Submittal Procedures.
- B. Prior to commencing the Work, submit manufacturer's independent Laboratory Report for the Air Barrier Systems testing on ASTM E 2357 tested on a steel stud frame wall, results are to be based on Specimen 2 testing only.
- C. Prior to commencing the Work, submit documentation certifying that the air barrier system has been tested independently, indicating compliance with the performance requirements of the Air Barrier Association of Association.
- D. Prior to commencing the Work, submit copies of manufacturers' literature for the system, membrane, primers, sealants, adhesives and associated auxiliary materials shall be included as parts of the system that is listed by the Air Barrier Association of America evaluation.
- E. Prior to commencing the Work, submit references clearly indicating that the materials proposed have been installed for not less than three years on projects of similar scope and nature.
- F. Prior to commencing the Work, submit manufacturers' complete set of standard details for air barrier/vapor retarders. The manufacturer's representative shall review the contract drawings and note any modifications required to make the system air and water tight.

#### 1.06 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: Provide primary products, including each component of the air barrier membrane system, which has been commercially available for a minimum of 3 years.
- B. Submit in writing, a document stating that the applicator of the primary air barrier membrane specified in this section is recognized by the manufacturer as suitable for the execution of the Work.
- C. Perform Work in accordance with the printed requirements of the air barrier manufacturer and this specification.
- D. Maintain one copy of manufacturer instructions on site.
- E. At the beginning of the Work and at all times during the execution of the Work, allow access to Work site by the air barrier membrane manufacturer's representative.
- F. Components used in this section shall be sourced from one manufacturer, including sheet membrane, air barrier sealants, primers, mastics, tapes and adhesives as listed as an evaluated air barrier assembly by the Air Barrier Association of America.

#### 1.07 MOCK-UP

- A. Construct mock-up in accordance with Section 04200 – Quality Requirements: Requirements for a mock-up.

- B. Provide mock-up of air barrier materials under provisions of Section 04200 – Unit Masonry.
- C. Items to be incorporated in mock-up include:
  - 1. Masonry veneer system, through wall flexible flashing, glass-faced gypsum sheathing, wall ties, board insulation, metal studs, aluminum curtain wall frame, aluminium window frame, showing air barrier membrane application details and transition membranes.
  - 2. Masonry veneer system, concrete masonry backup, wall ties, through wall flexible flashing, board insulation, aluminium window frame, showing air barrier membrane application details and transition membranes.
- D. Allow 24 hours for inspection of mock-up by Architect before proceeding with air barrier work.

#### 1.08 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to the job site in undamaged and original packaging indicating the name of the manufacturer and product.
- B. All pail goods shall bear the ABAA Evaluated Air Barrier label
- C. Store roll materials on end in original packaging.
- D. Keep all products stored at above 40°F. Apply to a substrate with a surface T°F of 40°F and rising. **DO NOT ALLOW PRODUCT TO FREEZE.**
- E. Protect rolls from direct sunlight until ready for use.
- F. Do not double stack pail goods.

#### 1.9 COORDINATION

- A. Ensure continuity of the air seal throughout the scope of this section.

### PART 2 PRODUCTS

#### 2.01 MEMBRANES

- A. Liquid air barrier: One component elastomeric membrane, spray, trowel or brush applied, having the following characteristics and have passed all evaluations by the Air Barrier Association of America (ABAA) and be listed on their web site as having passed all the evaluations :
  - 1 Air permeability:
    - a. Air Leakage Thru Cured Films: <0.04 cfm/ft<sup>2</sup> @ 10.5 lbs/ ft<sup>2</sup> or <0.005 L/sm<sup>2</sup> @ 75 Pa to ASTM E283 (Modified) 24 hours, +/- 10%.
    - b. Air Leakage per ASTM E 2178, dry film, delta P of 0.3 inches of water, 0.002 +/- 10%
  - 2 Air Barrier System Test on Full Scale Wall Assembly, ASTM E 2357
    - a. System Air Leakage, 0.0008 CFM/ft<sup>2</sup> +/- 10%
    - b. Penetrations Check, MUST PASS ASTM E 2357 requirements
  - 3. Water Vapor permeance: (704 ng/Pa.m<sup>2</sup>.s.) 10 to 20 perms, ASTM E96 Method B. NOTE: **THE MATERIAL SPECIFIED IS VAPOR PERMEABLE.**
  - 4. Elongation (ASTM D412: >75%)
  - 5. Low temperature flexibility and crack bridging: Pass – ICC-ES AC212

6. ASTM D 1970, Self Sealability – Pass
7. AATCC 127 Water Resistance – Pass

B. Acceptable Manufacturers

1. STS Coatings, Wall Guardian, 830-995-5177  
www.wallguardian.com, a Certified Texas HUB
  - a. FW-100A, a non-asphaltic product
2. W.R. Grace, Perm-a-Barrier VP a non-asphaltic product

C. Transition Membrane, Self-Adhering: Polymer-based, sheet membrane complete with polyester facing, and having the following physical properties:

1. Thickness: 35 mils (0.5 mm) min.
2. Vapor permeance: <0.1
3. Low temperature flexibility: -20 F to CGSB 37-GP-56M;
4. Elongation: >90% to ASTM D412-modified;
  - a. Acceptable material:
    - 1) UT-40 by STS Coatings for use with the FW-100 system.
    - 2) Others as recommended by manufacturer

2.02 PRIMER

A. Primer for self-adhering membranes: Synthetic polymer-based adhesive type, quick setting, having the following characteristics:

- a. Acceptable material: As manufactured and/or recommended by the Air Barrier System manufacturer. **Note: Primer shall be compatible with specified glass faced gypsum sheathing.**
- b. Verify compatibility of self-adhering membranes with preservative treated materials specified in Section 06 10 53. Prime preservative treated materials as required using primer recommended by self-adhering membrane manufacturer or use the non-chemical thermally modified wood known as EcoPrem.

2.03 SEALANTS

- A. Sealants shall be compatible with air barrier systems and shall be approved by the air barrier manufacturer.
- B. Products:
  1. STS Coatings LT-100 Liquid Tape for concealed applications only and Great Seal PE-150 for concealed and exposed applications.
- C. Primers: As recommended by manufacturer for surfaces to be sealed.
- D. Backer Rods: As recommended by sealant manufacturer.
- E. Others as recommended by manufacturer

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that surfaces and conditions are ready to accept the Work of this section. Notify Architect in writing of any discrepancies. Commencement of the work or any parts thereof shall mean acceptance of the prepared substrate.

### 3.02 PREPARATION

- A. All surfaces must be sound, dry, clean and free of oil, grease, dirt, excess mortar or other contaminants. Fill spalled areas in substrates to provide an even plane.
- B. Mortar joints in concrete block and form tie holes/voids in poured concrete shall be filled flush and smooth and allowed to be cured for a minimum of 24 hours.
- C. All joints between gypsum sheathing, roof board, masonry and concrete and other substrate joints up to 1/4" wide shall be treated:
  - 1. STS Coatings LT-100 Liquid Tape, [www.stscoatings.com](http://www.stscoatings.com).
  - 2. York Manufacturing, US-100, [www.yorkmfg.com](http://www.yorkmfg.com)
  - 3. Others as recommended by manufacturer
- D. All joints between gypsum sheathing, roof board, masonry and concrete and other substrates wider than 1/4" shall be sealed with:
  - 1. UT-40, overlapping each side of joint a minimum of 3 inches
  - 2. Others as recommended by manufacturer
- E. Install backer rod and sealant at the following joints:
  - 1. All expansion/control/erection joints between concrete wall panels.
  - 2. All expansion/control joints in concrete block back-up.
  - 3. All joints between concrete wall panels and concrete block back-up.

### 3.03 PRIMER FOR TRANSITION MEMBRANE (SELF-ADHERING TYPE ONLY)

- A. Apply primer for self-adhering membranes at rate recommended by manufacturer.
- B. Apply primer to all areas to receive transition sheet membrane as indicated in Drawings by roller or spray and allow minimum 30 minute open time. Primed surfaces not covered by transition membrane during the same working day must be re-primed.

### 3.04 TRANSITION MEMBRANE (SELF-ADHERING TYPE)

- A. Align and position self-adhering transition membrane, remove protective film and press firmly into place. Ensure minimum 2 inch overlap at all end and side laps unless otherwise noted.
- B. Tie-in to roofing system and at the interface of dissimilar materials as indicated in Drawings.
- C. Promptly roll all laps and membrane with a counter top roller to affect seal.
- D. Ensure all preparatory work is complete prior to applying liquid membrane.

### 3.05 PRIMARY AIR BARRIER

- A. Apply by spray or roller, a complete and continuous unbroken film at a temperature of 40°F and rising with less than a 30% chance of rain in the next 18 hours and apply at the same rate as listed in the Air Barrier Association of America evaluation
  - 1. Exterior Gypsum Sheathing, Plywood or OSB
    - a. Wall Guardian FW-100A at a minimum of 2.5 gallons per 100 ft<sup>2</sup> (40 ft<sup>2</sup>/gallon) (40 wet mils)

- b. Perm-a-Barrier VP at a minimum rate of 5.5 gallons per 100 ft<sup>2</sup> (18 ft<sup>2</sup>/gallon) (90 mils wet)
  - c. Spray around all projections, including masonry veneer anchors, ensuring a complete and continuous air seal.
2. Concrete Masonry Unit (CMU), Concrete
- a. Wall Guardian FW-100A at a minimum of 2,5 gallons per 100 ft<sup>2</sup> (40 ft<sup>2</sup>/gallon) (equal to 40 wet mils on a smooth surface)
  - b. Perm-A-Barrier VP at a minimum rate of 5.5 gallons per 100 ft<sup>2</sup> (18 ft<sup>2</sup>/gallon) (equal to 90 wet mils on a smooth surface)
  - c. Spray around all projections including masonry veneer anchors ensuring a complete and continuous air seal.

### 3.06 INSPECTION

- A. Notify Architect when sections of work are complete so as to allow for review prior to installing insulation. The manufacturer's representative shall be on site to review the installation along with the Architect.

### 3.07 PROTECTION OF FINISHED WORK

- A. Liquid membranes are not designed for permanent exposure. Cover the liquid membrane, as recommended by the manufacturer, within the following time frames. Contractor shall verify the number of calendar days with the air barrier manufacturer:
  - 1. Cover the Wall Guardian material within 180 calendar days after installation. The nature of this product is such that some surface weathering may become apparent during exposure. This is a surface effect only and does not impact air barrier system performance.
  - 2. Transition membranes shall be covered within 180 days after installation
- B. Prepare, treat and seal vertical and horizontal surfaces at terminations and penetrations through the air barrier and at protrusions according to air barrier manufacturer's written instructions.

### 3.08 SCHEDULE

- A. Install liquid membrane system over the entire surface of the glass faced sheathing in the following area. Seal any masonry anchor penetrations air tight.
  - 1. In the masonry cavity wall.
- B. Install liquid membrane system over the entire surface of the outer surface of the inner wythe of masonry. Seal any masonry anchor penetrations air tight.
- C. Install liquid membrane system over the entire surface of the outer surface of the concrete wall panels. Seal any masonry anchor penetrations air tight.
- D. Install liquid membrane system over the entire surface of the glass faced gypsum sheathing and/or roof board in the following area:
  - 1. Behind the metal parapet panels.
  - 2. Behind the metal wall and soffit panels.
- E. Hollow Metal Door Frames: Seal door frame to wall surface with transition membrane.

- F. Wall and Roof Junction: Seal wall to roof with transition membrane.
- G. Seal joints in glass-faced sheathing with tape in the following areas:
  - 1. Cement plaster soffit.
- H. Seal the top of sheathing to the underside of the roof systems with foam or LT-100.
- I. Openings: Seal around the perimeter of all openings with transition membrane.
- J. Perimeter wood nailers at wall openings: Cover all exposed surfaces of wood nailers with transition membrane. Extend membrane over sheathing, masonry and metal framing as shown.
- K. Aluminum window frames with nailing flanges: Seal the nailing flanges to the wall surface with transition membrane.
- L. Aluminum window frames without nailing flanges: Seal frames to the wall surface with transition membrane.
- M. Aluminum storefront frames: Seal frames to the wall surface with transition membrane.
- N. Aluminum curtain wall frames: Seal frames to wall surface with transition membrane.

END OF SECTION

**DIVISION 7 THERMAL AND MOISTURE PROTECTION**  
**07412 STANDING SEAM METAL ROOF SYSTEM**

PART 1 GENERAL

1.1 AREAS INCLUDED

- A. Steep Slope SSR Metal Roof Areas

1.2 INSTALLER QUALIFICATIONS

- A. Roofing installer must be:
1. Currently prequalified with the Owner in accordance with Owner's prequalification requirements.
  2. Must be acceptable to roof material manufacturer for the manufacturer's warranty requirements.
  3. Currently in good standing with the manufacturer.
  4. Installer must be an experienced single firm specializing in the type of roofing repair and/or removal and replacement work required, employing only experienced workers for the class of work in which they are employed, having at least five (5) years successful experience on projects similar in size and scope and acceptable as applicators by the Owner's representative.
  5. Contractor must have successfully completed previous projects warranted by the manufacturer.
- B. It shall remain each Bidder's responsibility to determine his current status with the manufacturer's certification plan.

1.3 REFERENCES (INCLUDING LATEST REVISIONS)

- A. American Society for Testing and Materials:
1. ASTM A 792 Finish Application on Metal Wall Panels
  2. ASTM B 209 - 90, Specification for Aluminum and Aluminum Alloy Sheet and Plate
  3. ASTM C 719 - 86, Test Method for Adhesion and Cohesion of Elastomeric Joint Sealants Under Cycle Movement (Hockman Cycle)
  4. ASTM C 794 - 80 (1986), Test Method for Adhesion-in-Peel of Elastomeric Joint Sealants
  5. ASTM C 920 - 87, Specification for Elastomeric Joint Sealants
  6. ASTM A 361 - 90, Sheet Steel, Zinc-Coated (Galv.) by the Hot-Dip Process for Roofing and Siding
  7. ASTM C 177, Test for Thermal Laboratory Services
  8. ASTM C 728, Perlite Thermal Insulation Board
  9. ASTM D 523 Reflective Finish on Metal Roof Panels
- B. Federal Specifications:
1. LLL-I-535B
  2. SS-A-701B
  3. SS-C-153
  4. SS-C-153C
  5. SS-R-620B
  6. TT-C-498C
  7. TT-P-320D

8. TT-S-00227E
  9. TT-S-00230C
  10. SS-S-001534 (GSA-FSS)
  11. L-P-375
- C. Industry Standards:
1. The National Roofing Contractors Association (NRCA) - Roofing and Waterproofing Manual
  2. Sheet Metal and Air Conditioning Contractors National Association (SMACNA) - Architectural Sheet Metal Manual
- D. Testing Laboratory Services: Test results shall meet or exceed established standards.
- E. Underwriters Laboratories, Inc.; Roofing Covering: Class A fire hazard classification.
- F. Factory Mutual: Wind uplift requirements.

#### 1.4 SUBMITTALS

- A. Samples and Manufacturer's Submittals: Submit prior to delivery or installation.
1. Samples of all roofing system components including all specified accessories.
  2. Submit samples of proposed warranty complete with any addenda necessary to meet the warranty requirements as specified.
  3. Submit latest edition of manufacturer's specifications and installation procedures. Submit only those items applicable to this project.
  4. A written statement from the roofing materials manufacturer approving the installer, specifications and drawings as described and/or shown for this project and stating the intent to guarantee the completed project.
- B. Shop Drawings: Provide manufacturer's approved details of all perimeter conditions, projection conditions, and any additional special job conditions which require details other than indicated in the drawings.
- C. Maintenance Procedures: Within ten days of the date of Substantial Completion of the project, deliver to the Owner three copies of the manufacturer's printed instructions regarding care and maintenance of the roof.

#### 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in manufacturer's original packaging with all labels intact and legible, including labels indicating storage conditions, lot numbers, and usage instructions. Materials damaged in shipping or storage shall not be used.
- B. Manufacturer's packaging and/or roll plastic is not acceptable for exterior storage. Tarpaulin with grommets shall be minimum acceptable for exterior coverings. All materials stored as above shall be minimum of four inches (4") off the substrate, and the tarpaulin tied off with rope.
- C. Deliver materials requiring fire resistance classification to the job with labels attached and packaged as required by labeling service.
- D. Deliver materials in sufficient quantity to allow continuity of work.
- E. Handle and store material and equipment in such a manner as to avoid damage. Liquid products shall be delivered sealed, in original containers.
- F. Handle rolled goods so as to prevent damage to edge or ends.
- G. Select and operate material handling equipment so as not to damage existing



construction or applied roofing.

- H. Moisture-sensitive products shall be maintained in dry storage areas and properly covered. Provide continuous protection of materials against wetting and moisture absorption. Store roofing and flashing materials on clean raised platforms with weather protective covering when stored outdoors.
- I. Store rolled goods on end.
- J. Protect materials against damage by construction traffic.
- K. The proper storage of materials is the sole responsibility of the contractor and any wet or damaged roofing materials shall be discarded, removed from the project site, and replaced prior to application.
- L. Comply with fire and safety regulations, especially with materials which are extremely flammable and/or toxic. Use safety precautions indicated on labels.
- M. Products liable, such as emulsions, to degrade as a result of being frozen shall be maintained above 40° F in heated storage.
- N. No storage of materials shall be permitted on roof areas other than those materials that are to be installed the same day. Any exception must be in written form.

## 1.6 SITE CONDITIONS

- A. Job Condition Requirements:
  - 1. Apply roofing in dry weather.
  - 2. Do not apply roofing when ambient temperature is below 40° F (4° C).
  - 3. Proceed with roofing work only when weather conditions are in compliance with manufacturer's recommended limitations, and when conditions will permit the work to proceed in accordance with specifications.
  - 4. For further information regarding roofing material manufacturer's recommendations for project conditions, refer to the manufacturer's published application manual.
  - 5. All surfaces to receive new roofing shall be smooth, dry, and free from dirt, debris, and foreign material before any of this work is installed. Competent operators shall be in attendance at all times equipment is in use. Materials shall be stored neatly in areas designated by the Owner. Load placed on the roof at any point shall not exceed the safe load for which the roof is designed.
  - 6. The contractor shall take all necessary precautions to protect the roof mat and deck from damage. The contractor shall be responsible for repairing all new areas of damage caused by the negligence of the contractor, at the contractor's expense. The Owner's on-site representative shall determine damage caused by contractor negligence.
  - 7. Follow insurance underwriter's requirements acceptable for use with specified products or systems.
  - 8. Surface and air temperatures should be a minimum 45° F during applications of cleaner and waterproof coating and remain above 45° F for a minimum of four (4) hours following applications. Verify compatibility of cleaner with coatings, paints, primers and joint sealers specified. Advise Owner's representative of any problems in this regard prior to commencing cleaning operations.
- B. Protection of Work and Property:

1. Work: The contractor shall maintain adequate protection of all his work from damage and shall protect the Owner's and adjacent property from injury or loss arising from this contract. He shall provide and maintain at all times any OSHA required danger signs, guards, and/or obstructions necessary to protect the public and his workmen from any dangers inherent with or created by the work in progress. All federal, state, and city rules and requirements pertaining to safety and all EPA standards, OSHA standards, NESHAP regulations pertaining to asbestos as required shall be fulfilled by the contractor as part of his proposal.
  2. Twenty-four Hour Call: The contractor shall have personnel on call 24 hours per day, seven (7) days per week for emergencies during the course of a job. The Owner's project manager is to have the 24 hour numbers for the contact. Contractor must be able to respond to any emergency call and have personnel on-site within two (2) hours after contact. Numbers available to the Owner's project manager are to be both home and office numbers for:
    - a) Job Foreman
    - b) Job Superintendent
    - c) Owner or Company Officer
- C. Damage to Work of Others: The contractor shall repair, refinish, and make good any damage to the building or landscaping resulting from any of his operation. This shall include, but is not limited to, any damage to plaster, tile work, wall covering, paint, ceilings, floors, or any other finished work. Damage done to the building, equipment, or grounds must be repaired at the successful contractor's expense holding the Owner harmless from any other claims for property damage and/or personal injury.
- D. Measurements: It will be the contractor's responsibility to obtain and/or verify any necessary dimensions by visiting the job site, and the contractor shall be responsible for the correctness of same. Any drawings supplied are for reference only.
- E. Cleaning and Disposal of Materials:
1. Contractor shall keep the job clean and free from all loose materials and foreign matter. Contractor shall take necessary precautions to keep outside walls clean and shall allow no roofing materials to remain on the outside walls.
  2. All waste materials, rubbish, etc., shall be removed from the Owner's premises as accumulated. Rubbish shall be carefully handled to reduce the spread of dust. A suitable scrap chute or hoist must be used to lower any debris. At completion, all work areas shall be left broom clean and all contractor's equipment and materials removed from the site.
  3. All bituminous or roofing related materials shall be removed from ladders, stairs, railings, and similar parts of the building.
  4. Debris shall be deposited at an approved disposal site.

## 1.7 WARRANTY

- A. Roofing - Manufacturer: Project shall be installed in such a manner that the material manufacturer will furnish a written ten (10) year labor and materials watertight warranty from the date of substantial completion of the completed project.
- B. Project shall be completed in such a manner that the material manufacturer shall furnish a standard twenty (20) year warranty on the product finish against oxidation failure.

- C. Roofing - Contractor: The contractor, jointly with any subcontractors employed by him, shall guarantee the work required and performed under this contract will be free from defects in workmanship and materials, and that the building will be and remain waterproof for a two (2) year warranty period, after the Owner accepts the work as substantially complete. The warranty shall be in approved notarized written form, to obligate the contractor and his subcontractors, if any, to make good the requirements of the warranty.
- D. Warranty repairs shall be performed by a certified installer. The repairs shall be performed in accordance with the manufacturer's written instructions and recommended procedures so as to not void the warranty. Repair of the system, including materials and labor, shall be done at no cost to the Owner.
- E. During the proposal period each Bidder shall make arrangements with the material manufacturer to provide the required warranty. Refer to SUBMITTALS Paragraph above in this section for requirements concerning submittals of warranty.

## PART 2 PRODUCTS

### 2.1 GENERAL

- A. All materials shall be furnished, specified, or approved in writing by the manufacturer issuing the warranty.
- B. Samples of all materials used on the project, which are not supplied by the membrane manufacturer, shall be submitted to the primary roofing manufacturer for written approval prior to work starting.
- C. All materials used on the project shall be asbestos free.

### 2.2 UNDERLAYMENT MEMBRANE

- A. Membrane shall be nominal sixty (60) mil in overall thickness consisting of forty-five (45) mil thick calendered coal-tar elastomeric membrane thickness with fifteen (15) mil thick backing of styrene butadiene styrene (SBS) adhesive with a selvage edge. The self-adhering membrane shall be a high-performance elastomeric membrane incorporating DuPont™ Elvaloy® KEE (ketone ethylene ester), extended with coal-tar pitch and reinforced with polyester fibers.
- B. The self-adhering membrane shall meet the following physical properties: Elongation 170%, ASTM D 412; Tensile Strength 1600 lbs/in<sup>2</sup>, ASTM D 412; Tear Strength 300 ppi, ASTM D 624; Density at 70° F, 80 lbs/ft<sup>3</sup>; Low Temperature Flexibility, Pass, 37-GP-56M; and Water Absorption less than 0.1%, 37-GP-56M. Roll shall have one and one-half inch (1-1/2") wide dry lap for hot-air welding.

### 2.3 UNDERLAYMENT FLASHING MEMBRANE

- A. Flashing shall be same base material as the finish ply self-adhered coal-tar elastomeric membrane (CTEM) and be installed using the design principles set forth in the National Roofing Contractors Association Manual and attached details.

### 2.4 END LAP MEMBRANES

- A. End lap shall be a sixty (60) mil overall calendered thickness membrane. The membrane shall be a high performance elastomeric membrane incorporating a

DuPont™ Elvaloy® KEE (ketone ethylene ester), extended with coal-tar pitch and reinforced with polyester fibers.

- B. End lap splice strip shall be the same type material as the finish ply membrane not to exceed nominal 60 mils in overall calendared thickness. Strips shall be nine inches (9") by forty-two inches (42") long. All four edges shall have a minimum one and one-half inch (1-1/2") wide dry lap for hot-air welding.

## 2.5 CAULKS

- A. Sealant for use at coping joints, reglet joints, etc., shall be a one-component urethane non-sag, gun grade sealant designed for use in active exterior joints, and shall meet or exceed Federal Specification No. 1 TT-S-00230C, Type II, Class A, ASTM C 920. Where joint surfaces are contained or are contaminated with bituminous materials, provide manufacturer's modified-type sealant (modified with coal-tar or asphalt as required) as manufactured by Sonneborn (RC-708), or approved equal.
- B. To seal the leading edge of the CTEM membrane, to bond CTEM at terminations with metal, and for open CTEM seam repair, sealant shall be a thermosetting, solvent free, non-slump, self-fixturing, multipurpose structural sealant which shall meet the following physical and performance properties, M-1 as manufactured by Chem Link Inc., or approved equal.

### Properties

Specific Gravity	1.62 (13.5 lbs./gallon)
Viscosity	800,000 cps Brookfield RTV, TF spindle, 4 rpm 70 degrees F.
Shear Strength (ASTM D-1002)	300 psi+ (7 day ambient cure)
Elongation @ break (ASTM D-412)	300% (7 day ambient cure)
Hardness Shore A (ASTM C-661)	50 – 55 (14 day ambient cure)
Tack free time (ASTM C-679)	35 minutes
Low temperature flex	Minus 20 degrees F: PASS
Slump (sag) (ASTM C-639)	Zero slump
Shrinkage (ASTM D-2453)	No measurable shrinkage (14 day cure)
Service temperature	-40 degrees F to 200 degrees F

## 2.6 FASTENERS

- A. Shall be Factory Mutual approved and as recommended by the manufacturer for the specific application.
- B. Fastener for Brick: Shall be one-fourth inch by two inch (1/4" x 2"), zinc with plated steel or stainless steel nail, one piece unit, flat head.
- C. Fastener for Wood Deck: Shall be a annular threaded shank with a galvanized round and square cap of appropriate length for use in attaching base sheets to wooden substrates.
- D. Fastener for Miscellaneous Metal Roof Application: Shall be a #12 fastener, fluorocarbon coated, with CR-10 coating. A minimum .200 diameter shank and .250 diameter thread. To be used with round pressure plates or bar, and having a fluorocarbon CR-10 coating, when subjected to thirty (30) Kesternich cycles (DIN 50018) shows less than 10% red rust which surpasses Factory Mutual Approval Standard 4470. Fasteners, plates, and/or bars shall be listed in the Factory Mutual Approval Guide.

2.7 WOOD

- A. All nailers, wooden cants and wooden curbs shall be treated lumber as required by NRCA, Factory Mutual and Underwriters Laboratory and installed according to NRCA and Factory Mutual guidelines.

2.8 ASPHALT ROOF PRIMER

- A. Quick-dry asphalt-based primer for priming of asphalt roof surfaces.

Applicable Federal Specification	SS-A-701B
ASTM	D 41
Flash Point	105° F
Viscosity at 80° F (ASTM D 217)	50-60 K.U.
Weight per gallon	7.4 pounds
Drying time (to touch)	Min. 4 hours

2.9 STYRENE, BUTADIENE, STYRENE (SBS) PRIMER

- A. SBS primer made from natural resins, solvent and synthetic rubber. For application on concrete, metal or wooden substrate.

2.10 ASPHALT FLASHING CEMENT

- A. Designed for laying-up cold process roof membrane flashings where fast-setting adhesive is required.

Applicable Federal Specification	SS-C-153C, Type I
ASTM	D 4586
Flash Point	105° F (41° C)
Weight per gallon (approximate)	10.8 lbs.
Viscosity @ 77° F (25° C) (ASTM D 217)	230-330
% Non-Volatile (Fed. Test Method 141)	68% Min.
% Specially Processed Bitumen	42% Min.
% Total Solids, by Volume	60% Min.
Cured film thickness of 1 gal./15 sq. ft.	75 MILS
Drying time	2 to 3 days
Service Temperature, Extended Exposure	-40° to +180° F
Resistance to Oils & Solvents	Poor
Resistance to Sunlight	Good
Resistance to Chemicals	Good
Effects of Weathering	Slight chalking
Water Resistance	
Under Good Drainage Conditions	Excellent
Under Continuous Submersion	Fair

2.11 STANDING SEAM ROOF PANELS

- A. Panels:
  1. Shall be prefinished Galvalume™ UL 90 rated, 24-gauge, sixteen (12") seam sheet made up of 55% aluminum, 1.6% silicon and the balance zinc as described in ASTM specification A792, as manufactured by Peterson Aluminum Company, Metal Buildings and Components, Inc., Architectural Building Components, or pre-approved equal.
  2. Factory fabricates panel with 2" vertical leg, mechanically seamed system with concealed fasteners. **Field formed panels will not be acceptable.**
  3. All held panels shall be continuous, no exceptions.
  4. Panel Fabrication:
    - a) Provide factory formed panel width of 12" with 2" vertical leg.

- b) Provide panels in full length from ridge to eave.
    - c) Striations to be furnished on all panels over twelve inches (12") wide.
  - 6. Seams:
    - a) Shall be mechanically seamed. Hand seaming not allowed except at areas not attainable by machine.
  - 7. Seam Size:
    - a) Vertical leg to be 2".
- B. Clip/Fastener Assemblies:
  - 1. UL 90 Requirements:
    - a) Fasteners: Manufacturer's standard #10 – 16 x 1" long self-drilling, self-tapping pancake head Phillips drive screws for metal; noncorrosive base material.
  - 2. Standard Clip: 24-gauge galvanized steel, 33 ksi yield strength, and 2" long single fastener type.
  - 3. Standard Fasteners: Same as UL 90 fasteners specified above.
  - 4. Clips:
    - a) Provide UL listed (standard) clip designated to allow panels to thermally expand and contract.
    - b) Fabricate clips with embossments that raise underside of panels above substrate to allow underside ventilation and prevent clip deformation.
    - c) Fabricate clips with structurally embossed outstanding legs to prevent distortion to wind uplift forces.
  - 5. Nailable Substrate Fasteners: #10 – 12 x 1" long A-Point fastener, pancake head Phillips drive screws for plywood; noncorrosive base material.
- C. Accessories:
  - 1. Provide manufacturer's standard accessories and other items essential to completeness of standing seam roof installation.
  - 2. Provide nylon seam end plugs for clean termination of panel.
  - 3. Gutters and downspouts will be fabricated to the same gauge and specification as panel and match metal profile of the details herein.
- D. Field Sealant:
  - 1. Color coordinated primerless silicone or high grade, nondrying butyl as recommended by panel manufacturer.
  - 2. Do not use sealant containing asphalt.
- E. Engineer panels to use concealed anchors that permit expansion and contraction. Exposed fasteners in roofing panels will not be permitted.
- F. Provide factory eave panel notch for eave termination (to be utilized with joggle cleat detail).
- G. Panel Finish:
  - 1. Full strength 70% Kynar 500® coating baked on for 15 minutes at 450° F to dry-film thickness of 1.0 mil.
  - 2. 15% reflective gloss (ASTM D 523), (Low Gloss).
  - 3. 0.3 mil baked on epoxy primer.
  - 4. **Color as selected by Architect from manufacturer's Kynar 500, Architectural Signature 300 Standard colors.**

## 2.12 POLYISOCYANURATE COMPOSITE NAILBASE RIGID BOARD ROOF INSULATION

- A. Nailable-Deck/Polyisocyanurate Composite Nailbase Rigid Board Roof Insulation: Rigid thermal composite insulation with polyisocyanurate closed-cellfoam core with factory applied rigid 5/8" OSB plywood nailable board one side and manufacturer's standard facing other side; polyisocyanurate complying with FS HH-I-1972/3, Class I; aged R-values as designated at mean temperatures indicated, after conditioning per RIC/TIMA Bulletin #281-1; and as follows:
1. Surface Burning Characteristics: Maximum flame spread of 25.
  2. Thermal Resistivity: R-19 minimum at 75° F.
  3. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work include, but are not limited to, the following:
    - a) Atlas Roofing Corp.
    - b) Hunter Products:
- B. Additionally, other manufacturers' nailable deck composite board roof insulation products acceptable to the shingle manufacturer and certified as an acceptable component in indicated UL designs may be submitted for consideration when meeting, or exceeding, the indicated performance criteria with no change in thickness.

## 2.13 FLEXIBLE PIPE FLASHING SYSTEM

- A. Flexible, one piece, pipe flashing system, made of long life, weatherproof gray EPDM rubber or red silicone; shall have corrosion resistant aluminum base which will conform to any panel configuration, Dektite, as manufactured by ITW Buildex, or approved equal.

## 2.14 DELIVERY AND STORAGE

- A. All materials shall be delivered with appropriate carton and can labels indicating appropriate warnings, storage conditions, lot numbers, and usage instructions. Materials damaged in shipping or storage shall not be used.

## 2.15 PRECAUTIONS

- A. Some of the indicated materials are extremely flammable and/or toxic. Use precautions indicated on can and carton labels.

## 2.16 POLYURETHANE SEALANT

- A. Except as otherwise indicated, provide manufacturer's standard, non-modified, one part sealant, polyurethane-based, elastomeric sealant; complying with either ASTM C 920, Type M, Class 25, or FS TT-S-00227E, Class A; self-leveling grade/type where used in joints of surfaces subject to traffic, otherwise non-sag grade/type.
- B. Durability: Less than 0.5 square inch adhesion/cohesion loss for three (3) samples of both mortar and aluminum; ASTM C 719 test procedure.
- C. Adhesion in Peel: Fifteen pound (15#) peel strength and ten percent (10%) maximum loss of bond to substrate; ASTM C 794.
- D. Bituminous Modification: Where joint surfaces contain or are contaminated with bituminous materials, provide manufacturer's modified type sealant which is compatible with joint surfaces (modified with coal-tar or asphalt as required).

## 2.17 SEALANT BACKER ROD

- A. Provide compressible rod stock of polyethylene foam, polyurethane foam, polyethylene jacketed polyurethane foam, butyl rubber foam, neoprene foam or other flexible, permanent, durable, non-absorptive material as recommended by sealant manufacturer for back-up of and compatibility with sealant. Where used with hot-applied sealant, provide heat-resistant type which will not be deteriorated by sealant application temperature as indicated.

## 2.18 MISCELLANEOUS MATERIALS

- A. Other materials shall be as specified or of the best grade for the proposed use as recommended by the manufacturer.

## PART 3 EXECUTION

### 3.1 REFERENCE

- A. The manufacturer's Technical Specifications shall be considered a part of this specification and should be referred to for more specific application procedures and recommendations.
- B. Application of materials shall be in strict accordance with the manufacturer's recommendations except where more stringent requirements are shown or specified. In the instance of a conflict between these specifications and those of the manufacturer, the more stringent specifications shall take precedence.
- C. General Installation:
  - 1. Protect adjacent areas with tarpaulin or other durable materials.
  - 2. Contractor shall prevent overspray, and be responsible for parking lot areas and/or adjoining areas not part of this contract.
  - 3. Contractor shall be responsible for sealing, as required, all openings that may allow bitumen migration or drippage, i.e. pitch dams, envelopes, and filler strips.
  - 4. Prepare surfaces according to manufacturer's or applicator's published instructions. All metal that is to receive bitumen, or come in contact with bitumen or adhesive, shall be first primed with appropriate primer. Any prefinished galvanized sheet steel that is to receive bitumen, or come in contact with bitumen or adhesive, shall be scored, scuffed or abraded before receiving primer application.
  - 5. Use cleaning materials or primers necessary to render an acceptable surface/substrate.
  - 6. All surfaces/substrates shall be clean and dry prior to application of materials.
  - 7. Prior to application of membrane, all foreign matter, gravel, etc., shall be removed from the insulation and/or substrate. Gravel or debris between the insulation/substrate and plies is not acceptable.
  - 8. Ambient temperature shall be 50° F and rising.
  - 9. All plies shall be laid in the direction of maximum roof slope, working from bottom of slope toward ridge.



10. Any self-adhered membranes shall be picture framed on all roof areas as the system is being applied. The outer edge of the picture frame sheet shall extend over the edge and turn down a minimum to completely cover the wood nailers. All end laps of the field sheets of the self-adhered coal-tar elastomeric membrane shall lap the picture frame sheet a minimum of eight inches (8") or the picture frame sheet side laps shall lap the field sheet a minimum of eight inches (8").
11. Wrinkles, buckles, kinks, and fishmouths are not acceptable when laying felt and membrane.
12. Dry voids of felt on felt or membrane on membrane are not acceptable.
13. All vertical flashings shall be mechanically top-fastened with a termination bar a minimum of six inches (6") on center at the top leading edge, and be a minimum of eight inches (8") in height from finished membrane.
14. On slopes greater than one inch (1") in twelve inches (12"), refer to NRCA and/or manufacturer's guidelines for backnailing procedures and follow the more stringent guidelines for all specified materials.
15. All base sheet applications and surfaces that are to receive the self-adhered membranes shall be primed with a fast drying asphaltic primer. Except when self-adhered membrane is to be installed over a CTEM surface.

### 3.2 SUBSTRATE PREPARATION

- A. Substrate shall be smooth, free of debris, sharp edges, and other surface irregularities prior to starting roofing application. Substrate repair shall be performed as required to minimum of NRCA standards.
- B. Wood Decks:
  1. Cracks wider than one-fourth inch (1/4"), or any opening of more than one-half inch (1/2"), shall be covered with securely nailed sheet metal.
  2. Care should be exercised so that the deck is not damaged when removing the existing roof.
  3. Any decking which is damaged, wet, or rotted must be replaced with exterior grade wood of similar type and size. All boards shall be securely nailed to the supporting members.
  4. Plywood decks shall be of exterior grade and securely nailed to supporting members. The plywood shall be a minimum of five-eighths inch (5/8") in thickness.
  5. All wood substrates shall be covered with self-adhered CTEM applied to wood substrate, nailed along perimeter only.

### 3.3 NAILERS

- A. Wooden nailers shall be installed at gravel stops or drip edges on outside perimeter of building according to NRCA, Factory Mutual and Underwriters Laboratory guidelines.
- B. All Construction: Nailers shall be the same height as the new insulation being installed where required. Nailers shall be raised if necessary by anchoring an additional nailer of appropriate height to the existing nailer if the existing nailer is not to be replaced. All existing nailers and new nailers, if required, shall be installed according to Factory Mutual and Underwriters Laboratory Guidelines.

### 3.4 INSTALLATION OF POLYISOCYANURATE NAILBASE COMPOSITE BOARD ROOF INSULATION

- A. Provide and install new nailable nailbase per manufacturer's recommendations over existing wood deck.
- B. Fasten through existing wood deck per manufacturer's requirements to meet local uplift requirements.

### 3.5 APPLICATION OF UNDERLAYMENT

- A. Unroll self-adhered membrane and allow to relax a minimum of two hours at 70° F plus temperature or longer if temperature is below 70° F. If after the period of relaxation, the membrane is not to be immediately installed, cover the membrane with white polyethylene tarp or release paper until ready for installation. All membrane applications shall be applied parallel with slope, no exceptions.
- B. Slide the membrane in place aligning with three inch (3") lap line. Fold second half of relaxes roll over the first half of relaxed roll. Kiss cut the release paper at the fold, taking care not to cut the adhesive and/or membrane, install two feet (2') of self-adhered membrane pulling release paper low to roof line. Roll excess release paper on unused core and pull low to the roof surface removing the release paper while simultaneously setting the remainder of the self-adhered membrane in place. Upon completion, fold first half of membrane over installed second half and repeat procedure. The end laps of the finish ply membrane shall be a minimum of three inches (3").
- C. Immediately following the laying of the self-adhering membrane, it shall be rolled in the width direction using a minimum seventy pound (70#) linoleum roller. This will prevent excessive entrapment of air beneath the membrane. The rolling is in the width direction and with the laps so as not to buck the laps.
- D. Position the next roll of self-adhering membrane adjacent to the membrane already applied so that there is a three inch (3") side lap. The membrane has a one and one-half inch (1-1/2") dry lap; therefore, the three inch (3") side lap will comprise one and one-half inch (1-1/2") adhered lap and one and one-half inch (1-1/2") welded lap.
- E. End laps of membrane shall be a minimum three inches (3"). If possible, lay the end laps in line.
- F. Picture frame all roof areas with self-adhered coal-tar elastomeric membrane (CTEM) as finish membrane ply is being applied. Rectangular type projections should also be picture framed.

### 3.6 LAP SPLICE

- A. Self-adhered coal-tar elastomeric membrane (CTEM) shall be installed as above with three inch (3") side laps. End laps shall be a minimum six inches (6") and in line if possible.

### 3.7 PERIMETER FASTENING

- A. Wood nailers are required for perimeter gravel stops or drip edges. Field membrane and all plies shall be mechanically fastened to nailer on twelve inch (12") centers maximum.

### 3.8 FLASHING - GENERAL

- A. Flashings shall be installed using the self-adhered coal-tar elastomeric membrane (CTEM) flashing, with length of run not to exceed the width of the material roll.
- B. Wooden nailers or curbs shall be installed at all edges and openings in the roof, mechanically fastened to the deck. The nailers should be of exterior grade timber, and of the same thickness as any insulation to be used on the roof.
- C. All existing substrates receiving flashing membrane shall be clean and primed with asphalt primer, prior to application.
- D. All flashings shall be mechanically fastened with a termination bar a maximum of six inches (6") on center, be a minimum of eight inches (8") above finished roof height, extend a minimum of nine inches (9") onto the field of horizontal roof membrane, and not exceed the width of the material roll.
- E. All surface mounted flashings terminated with a pressure bar shall have an additional surface mounted counterflashing installed immediately above the pressure bar. The counterflashing shall extend a minimum of two and one-half inches (2-1/2") below the pressure mounted termination bar. Both the top edge of the surface mounted termination bar and the surface mounted counterflashing shall be sealed with a liberal bead of sealant.
- F. All vertical flashing lap seams of the self-adhered coal-tar elastomeric membrane (CTEM) shall be hot-air welded. NOTE: Clean lap area of any bituminous adhesive prior to welding.
- G. The self-adhered flashing underlayment shall be applied from a minimum of eight inches (8") above the finished roof line down the vertical extending a minimum of nine inches (9") out onto the field of the roof. The finish ply membrane shall then be installed so as to extend from the field of the roof to a minimum of four inches (4") turned up the vertical. Following the installation of the finish ply membrane a minimum of four inches (4") above the cant, the top self-adhered flashing membrane shall be installed from a minimum of eight inches (8") above the finished roof line down the vertical extending a minimum of nine inches (9") out onto the field of the roof. All exposed vertical flashing and all exposed horizontal flashing laps shall be hot-air welded.
- H. All flashing membrane shall be adhered to the vertical flashing and to field of roof membrane; hot-air weld vertical laps. NOTE: All bitumen shall be removed from hot-air weld area.
- I. All flashing membrane shall be self-adhered to the vertical flashing, horizontal laps, and to field of roof membrane; hot-air weld vertical laps.
- J. Flashing laps shall be minimum three inch (3") width, no maximum.
- K. Hot-air weld of flashing lap shall be minimum one and one-half inch (1-1/2") width, no maximum.
- L. Any flashing extending further than eighteen inches (18") up onto a vertical surface shall be terminated at eighteen inch (18") height intervals and be mechanically fastened at the top with a termination pressure bar. The additional height needed to be flashed will have a second piece of self-adhered coal-tar elastomeric membrane (CTEM) lapping the terminated lower sheet by six inches (6"). The new piece shall be properly fastened with a termination bar.

- M. The self-adhered coal-tar elastomeric flashing sheets shall be run up the wall in three foot (3') widths and under the coping cap and terminated on the outside of the wall six inches (6") on center, then the coping cap may be set. All side laps are to be hot-air welded. The underlayment ply shall be a self-adhered coal-tar elastomeric membrane (CTEM).
- N. All hot-air welded seams/laps shall be tested daily with a probe for integrity, no variance.
- O. Hot-air Welding Laps:
  - 1. When using a hand-held hot-air welder, the seams should be pressed together using a hand-held roller. The speed and temperature settings of the welding equipment can be affected by the weather conditions at the site of application, therefore, these parameters should be set by the contractor by using two (2) pieces of self-adhered coal-tar elastomeric membrane (CTEM). Minimum width of hot-air weld one and one-half inches (1-1/2").
  - 2. Lay the laps together and apply pressure to the welded seam to ensure full adhesion.
  - 3. Allow the seams to set fully, and probe the entire length for voids. Reseam voids immediately with a hot-air gun and roller.

### 3.9 PROJECTION FLASHINGS

- A. Plumbing Vents: Soil vent stack pipes shall receive new boot flashings installed in strict accordance with practices set forth in the NRCA Roofing Manual. Projections that cannot be sealed thus should be boxed in and flashed as recommended by the roof membrane manufacturer.
- B. Square Projections: Lay the self-adhered coal-tar elastomeric membrane (CTEM) up to the projection, and cut membrane so that it will extend twelve inches (12") beyond the projection. Cut a slit in the membrane to correspond with the position of the projection, and lay the self-adhering membrane in place. Apply another layer of membrane in exactly the same fashion, but from the opposite direction. For metal flange-type projections, after doing above, strip in with six inch (6") strips of membrane.
- C. Round Projections: Cut membrane square and eighteen inches (18") from perimeter of projection. Slit square membrane with an "X" of proper size to ensure a close fit and positive seal. Place over projection, and adhere to clean membrane already on the roof. Cut a six inch (6") piece of membrane to apply as a collar, and secure with all stainless steel clamp.

### 3.10 STANDING SEAM METAL ROOF

- A. General:
  - 1. Examine substrate to ensure it is properly secured and prepared to receive metal roofing.
  - 2. Ensure substrate is installed flat, free from objectionable warp, wave and buckle.
  - 3. Do not proceed with installation until unsatisfactory conditions have been corrected.
- B. Standing Seam Roof Installation:
  - 1. Comply with manufacturer's instructions for assembly, installation and erection in order to achieve weathertight installation. Install in accordance with approved shop drawings.

2. Standing Seam System:
    - a) Install panels in accordance with manufacturer's instructions and recommendations.
    - b) Prior to application of metal roof panels, all underlayment shall be covered with kraft sheathing separator sheet or similar, no exceptions.
    - c) Anchor securely in place using clips and fasteners spaced in accordance with manufacturer's recommendations for design and wind load criteria, minimum wind uplift of FM 1-90 is required.
    - d) Fully seat adjacent panel to achieve continuous engagement of standing seam joint. Mechanically seam all panel seam joints.
    - e) All panels shall be installed in a workmanlike manner and panels true, straight and watertight.
  3. Dissimilar Metals:
    - a) Where sheet metal is in contact with dissimilar metals, execute juncture to facilitate drainage and minimize possibility of galvanic action.
    - b) At point of contact with dissimilar metal, coat metal with protective paint or tape which can be placed between metals.
  4. Field apply sealant to penetrations, transitions and other locations necessary (not standing seam) for airtight, waterproof installation.
- C. Cleaning: Clean exposed surfaces of work promptly after completion of installation.
- D. Protection: Protect work as required to ensure roofing will be without damage at time of final completion.

END OF SECTION

**DIVISION 7 THERMAL AND MOISTURE PROTECTION**  
**07651 UNIVERSALLY COMPATIBLE FLEXIBLE**  
**COPPER FLASHING/DRAINAGE SYSTEM**

PART 1 GENERAL

1.01 SUMMARY

- A. Section includes combination flashing, mortar deflection, and weep as complete one step flashing drainage system. *Flashing is universal in chemical compatible with all known air barriers, dampproofing, sealants and insulations used in cavity wall designs.*
- B. Related sections:
1. 04200 Unit Masonry
  2. 06100 Rough Carpentry.
  3. 07272 Fluid-Applied Membrane Air Barriers
  4. 07660 Flashing and Sheet Metal.

1.02 REFERENCES

- A. Standards of the following as referenced:
1. ASTM.
  2. Brick Industry Association (BIA).
  3. Copper Development Association, Inc. (CDA).
- B. Industry standards:
1. BIA *Technical Notes on Brick Construction No. 7, Water Penetration Resistance- Design and Detailing*, August 2005.
  2. BIA *Technical Notes on Brick Construction No. 28B, Brick Veneer/Steel Stud Walls*, August 2005.

1.03 DEFINITIONS

- A. Terms:
1. Cavity wall flashing: Same as flexible flashing.
  2. Foundation sill flashing: Same as flexible flashing.
  3. Flexible flashing: Water-proof material typically used in cavity wall construction to contain and assist in the proper water drainage that may penetrate wall system veneer. Other materials may be required to constitute the system.
  4. Head and sill flashing: Same as flexible flashing.
  5. Through-wall flashing:
    - a. Generally considered the same as flexible flashing.
    - b. Rare definition referred to full width cap flashing under copings or wall caps.

1.04 SUBMITTALS

- A. Product data: Indicate material type, composition, thickness, and installation procedures.
- B. Samples: 3" by 5" flashing material.
- C. **Product Quality & Environmental submittals:**
1. **Certificates:**
    - a. Indicate materials supplied or installed are asbestos free.
    - b. Indicate recycled content: >90% total recycled material; based on 80% Post Industrial Recycled Content and 10% Post Consumer Recycled Content.
  2. **Critical Performance Attributes:**

- a. Tensile Strength, >30,000 psi minimum average
  - b. Puncture Resistant, >270 pound average
  - c. Mold Growth, product resists growth of mold pursuant to test method ASTM D 3273-94.
3. **Fire Rating**
- a. Rated Class A, ASTM E84
4. **Specifier's Note:** Products/systems that meet/exceed the above listed Certificates and/or performance criteria **come with a Life of the Wall Warranty**

## 1.05 QUALITY ASSURANCE

### A. Qualifications:

- 1. Manufacturer: Provide flashing materials by single manufacturer.

## 1.06 WARRANTY

### A. Special warranty:

- 1. Manufacturer: **Warrant flexible flashing/drainage system material for life of the wall.**
- 2. Begin warranty at Date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.01 MANUFACTURED UNITS

#### A. Copper core flexible flashing/drainage system:

- 1. Product standard of quality:
  - a. York Manufacturing, Inc.; York Flash-Vent AB, ([www.yorkmfg.com](http://www.yorkmfg.com))
  - b. STS Coatings: Wall Guardian TWF, ([www.stscoatings.com](http://www.stscoatings.com))
  - c. Others provided they meet the requirements in section 1.04.C
- 2. Characteristics:
  - a. Type: Copper core with non-asphalt adhesive reinforced fabric laminated to one copper face and non-woven drainage fabric laminated to opposing face with non-asphalt adhesive.
  - b. Copper type, ASTM B248-06: CDA Alloy 110, 060 temper.
  - c. Fabrics:
    - 1) Fiberglass or reinforced synthetic fabric; laminated back face copper core.
    - 2) Non-woven drainage fabric: Fabric laminated to front face.
  - d. Size: Manufacturer's standard width rolls.
  - e. Polyether sealant: Suggested manufacturers: York Manufacturing UniverSeal US-100 or STS Coatings GreatSeal LT-100
  - f. Corner and splice material: York Multi-Flash 500/Gorilla Flash CF, 3 ounce, or pre-manufactured corners.

## PART 3 – EXECUTION

### 3.01 INSTALLATION

#### A. General:

- 1. Install where indicated, specified, or required in accord with flashing manufacturer's written instructions and as follows.
  - a. Splicing material on material width to manufacture wider pieces is prohibited unless flashing detail requires material wider than normally manufactured.
  - b. Prohibited practice: Bonding or splicing copper to non-woven drainage fabric or

- non-woven drainage fabric to non-woven drainage fabric.
2. Extend flashing 6" minimum, beyond opening, each side without stretching flashing material. Fold flashing ends at end of openings or horizontal flashing terminations to form end dam.
  3. Flashing width: Width required starting flush with outside face of exterior wythe, extending through cavity, rising height required to extend above lintel steel at least 2".
  4. Splice end joints by butting ends together over 12" wide piece of Multi-Flash copper flashing and sealing lap joint with UniverSeal 100 or GreatSeal LT-100 polyether sealant.
  5. Masonry back up:
    - a. Surface apply after dampproofing/air barrier installation specified in dampproofing/air barrier Section in accord with manufacturer's installation instructions.
    - b. Apply flashing with drainage surface to outside.
    - c. Fasten to masonry back-up surface at top by embedding in layer of UniverSeal US-100 polyether sealant using manufacturer's recommended nozzle.
  6. Concrete back up:
    - a. Surface apply after dampproofing/air barrier installation specified in dampproofing Section in accord with manufacturer's installation instructions.
    - b. Apply flashing with drainage surface to outside.
    - c. Fasten to concrete surface at top by embedding in bead of UniverSeal US-100 polyether sealant using manufacturer's recommended nozzle.
  7. Stud back up with sheathing:
    - a. Apply flashing with drainage surface to outside.
    - b. Fasten to stud back-up at top by embedding in bead of UniverSeal US-100 polyether sealant using manufacturer's recommended nozzle.
  8. Leave ready for building felt, dampproofing or air barrier installation lapping flashing top installed in another Section.
  9. Lay flashing in continuous bead of UniverSeal US-100 polyether sealant on masonry supporting steel.
  10. Fold ends of flashing at end of opening to form dam; seal with UniverSeal US-100 polyether sealant.
  11. Inside corners: Make in industry accepted manner using corner and splice material or purchase manufactured corners from manufacturer.
  12. Outside corners: Make in industry accepted manner using corner and splice material or purchase manufactured corners from manufacturer.

### 3.02 SCHEDULES

- A. Locations:
1. Exterior door heads.
  2. Window heads and sills.
  3. Storefront heads.
  4. Horizontal control joints.
  5. Changes in veneer materials, vertically.
  6. Other wall openings.
  7. Other locations indicated.

END OF SECTION



**DIVISION 7 THERMAL AND MOISTURE PROTECTION**  
**07660 FLASHING AND SHEET METAL**

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections apply to work of this section.

1.2 DESCRIPTION OF WORK

- A. Extent of each type of flashing and sheet metal work is indicated on drawings and by provisions of this section.
- B. Refer to each trade specification section for more specific information and requirements for sheet metal work to be performed in conjunction with each respective trade.

1.3 SUBMITTALS

- A. Product Data; Flashing, Sheet Metal, Accessories: Submit manufacturer's product data, installation instructions and general recommendations for each specified sheet material and fabricated product.
- B. Samples; Flashing, Sheet Metal, Accessories: Submit 8" square samples of specified sheet materials to be exposed as finished surfaces.

1.4 JOB CONDITIONS:

- A. Coordinate work of this section with interfacing and adjoining work for proper sequencing of each installation. Ensure best possible weather resistance and durability of work and protection of materials and finishes.

PART 2 PRODUCTS

2.1 FLASHING AND SHEET METAL MATERIALS:

A. SHEET METAL FLASHING/TRIM:

1. Zinc-Coated Steel: Commercial quality with 0.20% copper, ASTM A 526 except ASTM A 527 for lock-forming, G90 hot-dip galvanized, mill phosphatized where indicated for painting; 0.0359" thick (20 gauge) except as otherwise indicated.
2. Elastic Sheet Flashing/Membrane: Manufacturer's standard flexible, elastic, black, non reinforced, flashing sheet of 50-65 mils thickness; 50-70 Shore A Hardness (ASTM D 2240); 1200 p. s. i. tensile strength (ASTM D 412); 120 lbs. per linear in. tear resistance (ASTM D 624, Die C); ultimate elongation of 250% (ASTM D412); brittleness temperature of -30 deg. F (-35 deg. C) (ASTM D746); resistance to ozone aging of no cracks for 10% elongation sample for 100 hours in 50 pphm (50.5 mPa) ozone at 104 deg.F (70 deg. C) (ASTM D 1149); resistance to heat aging of max. hardness increase of 15 points, elongation reduction of 40%, and tensile strength reduction of 30%, for 70 hours at 212 deg. F (100 deg. C) (ASTM D 573).
3. Provide EPDM synthetic rubber sheet.

2.2 MISCELLANEOUS MATERIALS AND ACCESSORIES:

- A. Solder: For use with steel or copper, provide 50-50 tin/lead solder (ASTM B 32, with rosin flux).
- B. Fasteners: Same metal as flashing/sheet metal or, other non-corrosive metal as recommended by sheet manufacturer. Match finish of exposed heads with material being fastened.
- C. Bituminous Coating: FS TT-C-494 or SSPC - Paint 12, solvent type bituminous mastic, nominally free of sulfur, compounded for 15 mil dry film thickness per coat.
- D. Mastic Sealant: Polyisobutylene; non-hardening, non-skinning, nondrying, non-migrating sealant.
- E. Elastomeric Sealant: Generic type recommended by manufacturer of metal and fabricator of components being sealed; comply with FSTT-S-0027, TT-S-00230, or TT-S-001543.
- F. Epoxy Seam Sealer: 2-Part non-corrosive metal seam cementing compound, recommended by metal manufacturer for exterior/interior non-moving joints including riveted joints.
- G. Adhesives: Type recommended by flashing sheet manufacturer for waterproof / weather - resistant seaming and adhesive application of flashing sheet.
- H. Metal Accessories: Provide sheet metal clips, straps, anchoring devices and similar accessory units as required for installation of work, matching or compatible with material being installed, non-corrosive, size and gauge required for performance.
- I. Elastic Flashing Filler: Closed-cell polyethylene or other soft closed-cell material recommended by elastic flashing manufacturer as filler under flashing loops to ensure movement with minimum stress on flashing sheet.
- J. Roofing Cement: ASTM D 2822, asphaltic.

### 2.3 FABRICATED UNITS

- A. General Metal Fabrication: Shop-fabricate work to greatest extent possible. Comply with details shown, and with applicable requirements of SMACNA "Architectural Sheet Metal Manual" and other recognized industry practices. Fabricate for waterproof and weather-resistant performance; with expansion provisions for running work, sufficient to permanently prevent leakage, damage or deterioration of the work. Form work to fit substrates. Comply with material manufacturer's instructions and recommendations for forming material. Form exposed sheet metal work without excessive oil-canning, buckling and tool marks, true to line and levels indicated, with exposed edges folded back to form hems.
- B. Seams: Fabricate nonmoving seams in sheet metal with flat-lock seams. For metal other than aluminum, tin edges to be seamed, form seams, and solder. Form aluminum seams with epoxy seam sealer; rivet joints for additional strength where required.
- C. Expansion Provisions: Where lapped or bayonet-type expansion provisions in work cannot be used, or would not be sufficiently water/weatherproof, form expansion joints of intermeshing hooked flanges, not less than 1" deep, filled with mastic sealant (concealed within joints).

- D. Sealant Joints: Where movable, non-expansive type joints are indicated or required for proper performance of work, form metal to provide for proper installation of elastomeric sealant, in compliance with SMACNA standards.
- E. Separations: Provide for separation of metal from non-compatible metal or corrosive substrates by coating concealed surfaces at locations on contact, with bituminous coating or other permanent separation as recommended by manufacturer/fabricator.

### PART 3 - EXECUTION:

#### 3.1 INSTALLATION REQUIREMENTS:

- A. General: Except as otherwise indicated, comply with manufacturer's installations instructions and recommendations, and with SMACNA "Architectural Sheet Metal Manual". Anchor units of work securely in place by methods indicated, providing for thermal expansion of metal units; conceal fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints and seams which will be permanently watertight and weatherproof.
- B. Underlayment: Where stainless steel or aluminum is to be installed directly on cementations or wood substrates, install a slip sheet or red rosin paper and a course of polyethylene underlayment. Bed flanges of work in a thick coat of bituminous roofing cement where required for waterproof performance.
- C. Install reglets to receive counter-flashing in manner and by methods indicated. Where shown in concrete, furnish reglets to trades of concrete work for installation as work of Division-3 sections. Where shown in masonry, furnish reglets to trades of masonry work, for installation as work of Division-4 sections.
- D. Install counter-flashing in reglets, either by snap-in seal arrangement, or by welding in place for anchorage and filling reglet with mastic or elastomeric sealant, as indicated and depending on degree of sealant exposure.
- E. Install elastic flashing in accordance with manufacturer's recommendations. Where required, provide for movement at joints by forming loops or bellows in width of flashing. Locate cover or filler strips at joints to facilitate complete drainage of water from flashing. Seam adjacent flashing sheet with adhesive, seal and anchor edges in accordance with manufacturer's recommendations.
- F. Nail flanges of expansion joint units to curb nailers, at maximum spacing of 6". Fabricate seams at joints between units with minimum 3" overlap, to form a continuous waterproof system.

#### 3.2 CLEANING AND PROTECTION:

- A. Clean exposed metal surfaces, removing substances which might cause corrosion of metal or deterioration of finishes.
- B. Protection: Installer shall advise Contractor of required procedures for surveillance and protection of flashings and sheet metal work during construction, to ensure that work will be without damage or deterioration, other than natural weathering at time of substantial completion.

END OF SECTION

## **DIVISION 7 THERMAL AND MOISTURE PROTECTION**

### **07900 JOINT SEALERS**

*(Very Low VOC as Indicated: Section 2.3.E)*

#### **PART 1 GENERAL**

##### **1.1 SUMMARY**

- A. This Section includes joint sealants for the applications indicated in the Joint-Sealant Schedule at the end of Part 3.
1. Exterior joints in the following vertical surfaces and horizontal non-traffic surfaces:
    - a. Control and expansion joints in unit masonry.
    - b. Joints in exterior portland cement stucco
    - c. Joints between metal panels.
    - d. Joints between different materials listed above.
    - e. Perimeter joints between materials listed above and frames of doors, windows and louvers.
    - f. Control joints in ceilings and other overhead surfaces.
    - g. Other joints as indicated.
  2. Exterior joints in the following horizontal traffic surfaces:
    - a. Isolation and contraction joints in cast-in-place concrete slabs.
    - b. Joints between different materials listed above.
    - c. Other joints as indicated.
  3. Interior joints in the following vertical surfaces and horizontal nontraffic surfaces:
    - a. Control joints on exposed interior surfaces of exterior walls.
    - b. Perimeter joints of exterior openings where indicated.
    - c. Vertical joints on exposed surfaces of interior unit masonry walls and partitions.
    - d. Perimeter joints between interior wall surfaces and frames of interior doors, windows and elevator entrances.
    - e. Joints between plumbing fixtures and adjoining walls, floors, and counters.
    - f. Other joints as indicated.
  4. Interior joints in the following horizontal traffic surfaces:
    - a. Isolation joints in cast-in-place concrete slabs.
    - b. Control joints in tile flooring.
    - c. Other joints as indicated.

##### **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.

##### **1.3 SUBMITTALS**

- A. Product Data: For each joint-sealant product indicated.
- B. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.
- C. Samples for Verification: 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.

- D. Product Certificates: For each type of joint sealant and accessory, signed by product manufacturer.
- E. Qualification Data: For Installer.
- F. Compatibility and Adhesion Test Reports: From sealant manufacturer, indicating the following:
  - 1. Materials forming joint substrates and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.
  - 2. Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.

#### 1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.
- B. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.
- C. Perform acoustical sealant application work in accordance with ASTM C919.
- D. Product Testing: Obtain test results for "Product Test Reports" Paragraph in "Submittals" Article from a qualified testing agency based on testing current sealant formulations within a 36-month period preceding the commencement of the Work.
  - 1. Test elastomeric joint sealants for compliance with requirements specified by reference to ASTM C 920, and where applicable, to other standard test methods.
  - 2. Test elastomeric joint sealants according to SWRI's Sealant Validation Program for compliance with requirements specified by reference to ASTM C 920 for adhesion and cohesion under cyclic movement, adhesion-in-peel, and indentation hardness.
- E. Mockups: Build mockups incorporating sealant joints, as follows, to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution:
  - 1. Joints in mockups of assemblies specified in other Sections that are indicated to receive elastomeric joint sealants, which are specified by reference to this Section.

#### 1.5 PROJECT CONDITIONS

- A. Do not proceed with installation of joint sealants under the following conditions:
  - 1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F (5 deg C).
  - 2. When joint substrates are wet.
  - 3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
  - 4. Contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

#### 1.6 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: Two years from date of Substantial Completion.
- C. Special warranties specified in this Article exclude deterioration or failure of elastomeric joint sealants from the following:
  - 1. Movement of the structure resulting in stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression caused by structural settlement or errors attributable to design or construction.
  - 2. Disintegration of joint substrates from natural causes exceeding design specifications.
  - 3. Mechanical damage caused by individuals, tools, or other outside agents.
  - 4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Products: Subject to compliance with requirements, provide one of the products listed in other Part 2 articles.

### 2.2 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. VOC Content of Interior Sealants: Provide interior sealants and sealant primers that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
  - 1. Sealants: 250 g/L.
  - 2. Sealant Primers for Nonporous Substrates: 250 g/L.
  - 3. Sealant Primers for Porous Substrates: 775 g/L.
- C. 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. Single-Component Non-sag Polyether Sealant ES-A (**Very Low VOC [less than 2%]**):
  - 1. Available Products **Very Low VOC (less than 2%)**
    - a. STS Coatings, GreatSeal PE-.150 (830-995-5177)

- b. Sonneborn, Division of BASF: Sonolastic 150.
    - c. Sherwin-Williams, Stampede 1H.
  - 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.
    - a. Use O Joint Substrates: galvanized steel, brick, and concrete.
  - 6. Stain-Test-Response Characteristics: Nonstaining to porous substrates per ASTM C 1248.
  - 7. **Exterior Gypsum Joint Sealants (Very Low VOC less than 2%) (IECC Required)**
    - a. LT-100 Sealant by STS Coatings (830-995-5177)
    - b. UniverSeal by York Mfg. (800-551-2828)
- D. Single-Component Neutral-Curing Silicone Sealant ES- B:
  - 1. Available Products:
    - a. Sonneborn, Division of ChemRex Inc., BASF; Omniseal 50.
    - b. Dow Corning Corporation; 795
    - c. GE Silicones; SilPruf NB SCS9000.
    - d. Pecora Corporation; 895.
  - 2. Type and Grade: S (single component) and NS (nonsag).
  - 3. Class: 50.
  - 4. Use Related to Exposure: NT (nontraffic).
  - 5. Uses Related to Joint Substrates: M, G, A, and, as applicable to joint substrates indicated, O.
    - a. Use O Joint Substrates: Glass and color anodic aluminum.
- E. Single-Component Acid-Curing Silicone Sealant ES-C:
  - 1. Available Products:
    - a. Dow Corning Corporation; 999-A.
    - b. GE Silicones; Sanitary SCS1700.
    - c. Pecora Corporation; 860.
    - d. Sonneborn, Division of ChemRex Inc.; OmniPlus.
    - e. Tremco; Tremsil 200.
    - f. Sherwin-Williams, Silicone Rubber
  - 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: G, A, and, as applicable to joint substrates indicated, O.
    - a. Use O Joint Substrates: ceramic tile and stainless steel.
- F. Multicomponent Nonsag Urethane Sealant ES-D:
  - 1. Available Products:
    - a. Sonneborn, Division of ChemRex Inc.; NP 2.
    - b. Sherwin-Williams, Stampede 2NS.
  - 2. Type and Grade: M (multicomponent) and NS (nonsag).
  - 3. Class: 25.
  - 4. Uses Related to Exposure: T (traffic) and NT (nontraffic).
  - 5. Uses Related to Joint Substrates: M, G, A, and, as applicable to joint substrates indicated, O.
    - a. Use O Joint Substrates: Color anodic aluminum, galvanized steel, brick, and ceramic tile.

- G. Multicomponent Pourable Urethane Sealant ES-E:
1. Available Products:
    - a. Pecora Corporation; Dynatrol II-SG.
    - b. Sika Corporation, Inc.; Sikaflex - 2c SL.
    - c. Sonneborn, Division of ChemRex Inc.; SL 2.
    - d. Sherwin-Williams, Stampede 2 SL.
  2. Type and Grade: M (multicomponent) and P (pourable).
  3. Class: 25.
  4. Uses Related to Exposure: T (traffic) and NT (nontraffic).
  5. Uses Related to Joint Substrates: M, G, A, and, as applicable to joint substrates indicated, O.
    - a. Use O Joint Substrates: ceramic tile and concrete.

## 2.4 ACOUSTICAL JOINT SEALANTS

- A. Acoustical Sealant for Exposed and Concealed Joints AS-A: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834 and the following:
1. 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.
  2. Available Products:
    - a. Pecora Corporation; AC-20 FTR Acoustical and Insulation Sealant.
    - b. United States Gypsum Co.; SHEETROCK Acoustical Sealant.

## 2.5 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, 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.

## 2.6 PLASTIC FOAM JOINT SEALERS:

- A. Preformed, compressible, resilient, nonwaxing, nonextruding strips of plastic foam of material indicated below, and of size, shape, and density to control sealant depth and otherwise contribute to producing optimum sealant performance.

## 2.7 LATEX SEALANT APPLICATION STANDARD:



- A. Install sealant, including forming, packing and other accessory materials to fill opening around mechanical and electrical services penetrating floors and walls to provide fire-stops with fire resistance ratings indicated.

## 2.8 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

### 3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:
  - 1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
  - 2. 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. Porous joint substrates include the following:
    - a. Concrete.
    - b. Masonry.
    - c. Unglazed surfaces of ceramic tile.
  - 3. Remove laitance and form-release agents from concrete.
  - 4. 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. Nonporous joint substrates include the following:
    - a. Metal.
    - b. Glass.
    - c. Porcelain enamel.
    - d. Glazed surfaces of ceramic tile.

- 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.

### 3.3 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.
- B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. 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.
- D. 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.
- E. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
- F. 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.
- G. Tooling of Nonsag 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.
  - 4. Provide flush joint configuration where indicated per Figure 5B in ASTM C 1193.
  - 5. Provide recessed joint configuration of recess depth and at locations indicated per Figure 5C in ASTM C 1193.
    - a. Use masking tape to protect surfaces adjacent to recessed tooled joints.
- H. Installation of Preformed Tapes: Install according to manufacturer's written instructions.

- I. Installation of Preformed Silicone-Sealant System: Comply with the following requirements:
  1. Apply masking tape to each side of joint, outside of area to be covered by sealant system.
  2. Apply silicone sealant to each side of joint to produce a bead of size complying with preformed silicone-sealant system manufacturer's written instructions and covering a bonding area of not less than 3/8 inch (10 mm). Hold edge of sealant bead 1/4 inch (6 mm) inside masking tape.
  3. Within 10 minutes of sealant application, press silicone extrusion into sealant to wet extrusion and substrate. Use a roller to apply consistent pressure and ensure uniform contact between sealant and both extrusion and substrate.
  4. Complete installation of sealant system in horizontal joints before installing in vertical joints. Lap vertical joints over horizontal joints. At ends of joints, cut silicone extrusion with a razor knife.
- J. 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.

### 3.4 FIELD QUALITY CONTROL

- A. Field-Adhesion Testing: Field test joint-sealant adhesion to joint substrates as follows:
  1. Extent of Testing: Test completed elastomeric sealant joints as follows:
    - a. Perform 10 tests for the first 1000 feet (300 m) of joint length for each type of elastomeric sealant and joint substrate.
    - b. Perform 1 test for each 1000 feet (300 m) of joint length thereafter or 1 test per each floor per elevation.
  2. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab or Method D, Water Immersion in Appendix X1 in ASTM C 1193, as appropriate for type of joint-sealant application indicated.
    - a. For joints with dissimilar substrates, verify adhesion to each substrate separately; do this by extending cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.
  3. Inspect joints for complete fill, for absence of voids, and for joint configuration complying with specified requirements. Record results in a field-adhesion-test log.
  4. Inspect tested joints and report on the following:
    - a. Whether sealants in joints connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each type of product and joint substrate. Compare these results to determine if adhesion passes sealant manufacturer's field-adhesion hand-pull test criteria.
    - b. Whether sealants filled joint cavities and are free of voids.
    - c. Whether sealant dimensions and configurations comply with specified requirements.
  5. Record test results in a field-adhesion-test log. Include dates when sealants were installed, names of persons who installed sealants, test dates, test locations, whether joints were primed, adhesion results and percent elongations, sealant fill, sealant configuration, and sealant dimensions.

6. Repair sealants pulled from test area by applying new sealants following same procedures used originally to seal joints. Ensure that original sealant surfaces are clean and that new sealant contacts original sealant.
- B. Evaluation of Field Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

### 3.5 CLEANING

- A. 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.

### 3.6 PROTECTION

- A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

### 3.7 JOINT-SEALANT SCHEDULE

Location	Type	Color
A. Window Perimeter, Frames, Storefront Or Curtain Wall Assembly	B	To Match Adjacent
B. Door Frames / Wall Perimeters	A	To Match Adjacent
C. Under Thresholds Under Window system which rests directly on the floor slab in order to prevent infiltration	A	Black
D. Toilet Room Fixtures, Accessories Ceramic Tile	C	White
E. Intersection of dissimilar materials that allows water or air infiltration	A	To Match Adjacent
F. Perimeter Joints on interior side of door Frames, louvers in exterior walls	A	To Match Adjacent
G. Perimeter Joints of door frames, window frames And other framed openings in walls with no Finished edge flange.	A	To Match Adjacent
H. Open Joints at penetrations through walls, and open joints at penetrations through concrete or gypsum board ceilings, where intended to be tight sealed joints	A	To Match Adjacent
I. Open Joint, between dissimilar materials where intended to be tight, sealed joint.	A	To Match Adjacent
J. Joints where edge trim of gypsum board abuts irregular surfaces or other surfaces and leaves open joint	A	To Match Adjacent
K. Within and perimeter of Masonry System	A	To Match Adjacent

- |   |      |                   |
|---|------|-------------------|
| L. Intersection of dissimilar materials which installations not uniform or where workmanship does not meet acceptable construction tolerances, when such workmanship is acceptable by the Architect.  | A    | To Match Adjacent |
| M. Metal Siding, louvers, fixtures and other penetrations in building enclosures not otherwise sealed weathertight. Unless noted otherwise provide continuous sealing perimeter joints and all other joints at exterior soffits.  | A    | To Match Adjacent |
| N. Paving Floors joints<br>Expansion joints in and around concrete pavement, curbs, or other horizontal surfaces. In horizontal joints in concrete floor where intended to be tight, sealed joints. Expansion joints in concrete slabs, around column piers penetrating concrete slab, at all natural concrete slab expansion control points as specified | E    | To Match Adjacent |
| O. Within Glazing Systems   | B    | To Match Adjacent |
| P. Within Roofing System  | A, D | To Match Adjacent |

END OF SECTION

**DIVISION 8 DOORS AND WINDOWS**  
**08110 STEEL DOORS AND FRAMES**

**PART 1 - GENERAL**

**1.1 SECTION REQUIREMENTS**

- A. Submittals: Product Data, door schedule, and shop drawings that indicate general construction, configurations, jointing methods, reinforcements, and location of hardware.
  - 1. Provide manufacturers installation instructions and cut sheets for fire and smoke seals as required to comply with UL-10C and UL 1784
- B. Comply with ANSI/SDI 100.
- C. Fire-Rated Door Assemblies: NFPA 80, tested per ASTM E 152 and tested to meet UL 10B and 10C for neutral and positive pressure requirements. Labeled and listed by UL, ITS, or another testing and inspecting agency acceptable to authorities having jurisdiction.

**1.2 QUALITY ASSURANCE**

- A. Applicable Standards: Specifications and standards of SDI 100 (ANSI A250.8-2003).
- B. Fire-Rated Door Assemblies: Where fire-rated door assemblies are indicated or required, provide fire-rated door and frame assemblies that comply with NFPA 80 and have been tested, listed, and labeled in accordance with ASTM E2074-2001.
  - 1. Oversize Fire-Rated Door Assemblies: For door assemblies required to be fire-rated and exceeding sizes of tested assemblies, provide certificate or label from approved independent testing and inspection agency, indicating that door and frame assembly conforms to requirements of design, materials and construction as established by individual listings for tested assemblies.
  - 2. Temperature Rise Rating: At stairwell enclosures, provide doors, which have Temperature Rise Rating of 450 degrees F maximum in 30 minutes of fire exposure.
  - 3. Smoke and Fire Door Seals: Door supplier to provide UL-10c and UL1784 compliant seals as required at labeled openings.

**PART 2 - PRODUCTS**

**2.1 MATERIALS**

- A. Hot-Rolled Steel Sheets: ASTM A 569/A 569M.
- B. Cold-Rolled Steel Sheets: ASTM A 366/A 366M or ASTM A 620/A 620M.
- C. Galvanized Steel Sheets: ASTM A 653/A 653M, commercial steel, or ASTM A 642/A 642M, drawing quality, with A40 or A60 (ZF180 or Z180) coating designation, mill phosphatized.

**2.2 STEEL DOORS AND FRAMES**

- A. Hollow metal doors and frames shall be from one of the following:
  - 1. Dean Steel Manufacturing Co.
  - 2. Allied Steel Products, Inc.
  - 3. Ceco Corp.
  - 4. or approved equal
- B. Hollow metal doors shall be constructed with continuous vertical 16 ga channels and horizontal inverted 16 ga top and bottom channels. Hinge and lock reinforcements must be projection welded to the vertical channels.

- C. Steel Doors: 1-3/4-inch thick of materials and ANSI/SDI 100 grades and **specified below**.
  - 1. Interior Doors: GRADE II, heavy duty, Model 1, full flush design, minimum 18 ga. thick, cold-rolled steel sheet faces.
  - 2. Exterior Doors: GRADE III, extra heavy-duty, Model 2, insulated, full flush design, minimum 16 ga. Thick.
- D. Door Louvers: sight proof per SDI 111C.
  - 1. Fire-Rated Automatic Louvers: Actuated by fusible links at 150 deg F(65 deg C) and listed and labeled.
  - 2. Provide sight proof louvers for interior doors where indicated, constructed of 24-gauge steel V-shaped or y-shaped blades, set into 20-gauge steel frame.
  - 3. Provide weatherproof louvers with insect screen for exterior doors where indicated, constructed of 18 ga. steel.
- E. Door Silencers: Three on strike jambs of single-door frames and two on heads of double-door frames.
- F. Plaster Guards: Provide 26 gauge where mortar might obstruct hardware operation and to close off interior of openings.
- G. Fabricate steel frames to be rigid, neat in appearance, and free from defects, warp, or buckle.
  - 1. Interior Frames: Fabricate with mitered or coped **and face welded corners** formed from **16** ga. thick, cold-rolled steel for openings indicated on the drawings.
  - 2. Exterior Frames: Fabricate with mitered or coped and face welded corners, formed from 16 ga. thick steel sheet.
- H. Prepare doors and frames to receive hardware that is not surface applied according to SDI 107, see Division 8 Section "Door Hardware".
- I. Sealants: Per SDI 100 / ANSI A250.8 Appendix B (water penetration).
- J. Metal Door Frame Undercoating: Per SDI 100 / ANSI A250.8 section 4.2.2.
- K. Prime Coat: Standard manufacturers primer per SDI 100 / A250.8 section 2.05.
- L. Door Schedule: Provide materials and products that result in colors and finishes of surfaces complying with the Door Schedule.

## 2.3 ANCHORS AND ACCESSORIES

- A. Manufacturer's standard units. Use galvanized items for units built into exterior walls, complying with ASTM A 153.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Place steel frames to comply with SDI 105.
- B. Install steel doors accurately in frames, within clearances specified in ANSI/SDI 100.
  - 1. Fire-Rated Doors: Install with clearances specified in NFPA 80.
  - 2. Smoke-Control Doors: Comply with NFPA 105.
- C. DOORS AND FRAMES must be stored elevated from the floor and warranty requires they be stored in cool, dry place.

END OF SECTION

**DIVISION 8 DOORS AND WINDOWS**  
**08333 OVERHEAD DOORS**

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
  - 1. Manual overhead rolling doors. **N/A**
  - 2. Counter overhead doors (manual)
- B. Related Sections:
  - 1. 05500 Metal Fabrications. Door opening jamb and head members.
  - 2. 06100 Rough Carpentry. Door opening jamb and head members.
  - 3. 08710 Hardware. Padlocks. Masterkeyed cylinder.

1.2 SYSTEM DESCRIPTION

- A. Design Requirements:
  - 1. Wind Loading: Supply doors to withstand up to [ \_\_\_ psf ( \_\_\_ Pa) design wind load.
  - 2. Cycle Life: Design doors of standard construction for normal use of up to 20 cycles per day maximum.

1.3 SUBMITTALS

- A. Reference Section 01340 Submittal Procedures; submit the following items:
  - 1. Product Data.
  - 2. Shop Drawings: Include special conditions not detailed in Product Data. Show interface with adjacent work.
  - 3. Quality Assurance/Control Submittals:
    - a. Provide proof of manufacturer ISO 9001:2008 registration.
    - b. Provide proof of manufacturer and installer qualifications - see 1.4 below.
    - c. Provide manufacturer's installation instructions.
  - 4. Closeout Submittals:
    - a. Operation and Maintenance Manual.
    - b. Certificate stating that installed materials comply with this specification.

1.4 QUALITY ASSURANCE

- A. Qualifications:
  - 1. Manufacturer Qualifications: ISO 9001:2008 registered and a minimum of five years experience in producing doors of the type specified.
  - 2. Installer Qualifications: Manufacturer's approval.

1.5 DELIVERY STORAGE AND HANDLING

- A. Follow manufacturer's instructions.

1.6 WARRANTY

- A. Standard Warranty: Two years from date of shipment against defects in material and workmanship.



- B. Maintenance: Submit for owner's consideration and acceptance of a maintenance service agreement for installed products.

## PART 2 PRODUCTS

### 2.1 MANUFACTURER

- A. Subject to compliance with requirements, provide products of one of the following:
  - 1. CORNELL IRON WORKS INC.
  - 2. OVERHEAD DOOR CORP.
  - 3. OR APPROVED EQUAL
- B. Manufacturer shall furnish UL "Certificate of inspection for Oversized Doors" for fire-rated coiling overhead doors exceeding 120 S.F.
- C. Model:
  - 1. **ESC10** counter door with hood by Cornell or equal, clear anodized aluminum finish on door or hood. Aluminum bottom bar and guides. Manual crank hoist operated. Face of wall installation. Perimeter weather stripping.

### 2.2 SECTIONAL OVERHEAD DOORS:

- A. Provide complete operation door assemblies including frames, sections, brackets, guides, tracks, counterbalance, hardware, operators, and installation accessories.
- B. Steel Door Sections: ASTM A 446, Grade A or A526, galvanized steel sheets not less than 16 GA.
- C. Exterior section face, flat, ribbed or fluted to suit mfrs. standards.
- D. Fabricate door sections to provide units not more than 24" high, with rolled horizontal meeting edges forming a weather seal. Enclose ends and provide intermediate stiles and horizontal and diagonal reinforcing as required for stability.
- E. Finish steel door sections by cleaning, pretreating and applying mfrs. standard prime coat system. Finish painting by painter at field.
- F. Tracks, Supports and Accessories: Manufacturer's standard galvanized steel, sized for door weight and dimensions, complete with ball-bearing roller guides, brackets, bracing and reinforcing. Provide continuous rubber or neoprene weather-stripped at top and bottom of each door.

### 2.3 HARDWARE

- A. Manufacturer's standard, to suit size and type of door. Provide lifting handles, cremone type locking bars operable from inside and outside with chromium-plated operating handle and cylinder lock.

### 2.4 PERFORMANCE REQUIREMENTS

- A. Provide doors certified to withstand a 20 psf wind pressure.
- B. Door Curtain: Interlocking slats, one-piece for door width, as follows:
- C. Steel slats, ASTM A 446, Grade A, not less than 20 gage, hot-dipped galvanized per ASTM A 525, G90.

- D. Endlocks: Malleable iron castings, galvanized, secure to curtain slates.
- E. Bottom Bar: Two angles not less than 1/8" thick of same metal as curtain slats. Provide flexible rubber, vinyl, or neoprene weather seal and cushion bumper.
- F. Curtain Jamb Guides: Built-up of ASTM A 36 steel angles, channels, and flat bars as required.
- G. Weather Seals: Manufacturer's standard rubber or neoprene on metal pressure bars. Provide 1/8" thick continuous sheet secured to inside of curtain coil hood.
- H. Hood: Enclose coil curtain and operating mechanism and act as weatherseal. Provide closed ends for surface mounted hoods.
  - 1. Steel, not less than 24 ga., hot-dip galvanized.
- I. Shop Finish: Clean and paint ferrous metal and galvanized surfaces with manufacturer's standard rust inhibitive primer.
- J. Manual Door Operators: Provide except where electric operators indicated. When not shown, provide chain hoist operator unit.  
Crank-hoist operation with wall-mounted crank and crank gear box, steel crank drive shaft, and gear reduction unit requiring not more than 25 lbs. effort to turn crank. Provide unit which allows stopping curtain at any point in travel until movement is reactivated. Locate gear box on inside wall on jamb approx. 36" above floor, unless otherwise indicated. Furnish mfrs. crank locking device.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates upon which work will be installed and verify conditions are in accordance with approved shop drawings.
- B. Coordinate with responsible entity to perform corrective work on unsatisfactory substrates.
- C. Commencement of work by installer is acceptance of substrate.

### 3.2 INSTALLATION

- A. Set door and operating equipment complete with necessary hardware, jamb and head mold stops, anchors, inserts, hangers, equipment supports in accordance with mfrs. installation instructions.
- B. Follow manufacturer's installation instructions.
- C. Install all fire rated doors in accordance with NFPA Bull. No. 80.

### 3.3 ADJUSTING

- A. Following completion of installation, including related work by others, lubricate, test, and adjust doors for ease of operation, free from warp, twist, or distortion.

### 3.4 CLEANING

- A. Clean surfaces soiled by work as recommended by manufacturer.

B. Remove surplus materials and debris from the site.

### 3.5 DEMONSTRATION

A. Demonstrate proper operation to Owner's Representative.

B. Instruct Owner's Representative in maintenance procedures.

END OF SECTION

**DIVISION 9 FINISHES**  
**09200 LATH AND PLASTER**

PART 1 GENERAL

1.1 QUALIFICATIONS

- A. Five or more years experience in the lath and plaster trade. Member in good standing of Texas Lathing and Plastering Contractors Association.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's production data for cementitious materials, lath, metal support components, and accessories.
- B. Samples for verification purposes in units at least 24 inches square of each type of finish indicated, in sets for each color, texture, and pattern specified, showing full range of variations expected in these characteristics.

1.3 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials in original packages, containers, or bundles bearing brand name and identification of manufacturer.
- B. Store materials inside, under cover, and in manner to keep them dry, protected from weather, direct sunlight, surface contamination, aging, corrosion, and damage from construction traffic and other causes.

1.4 PROJECT CONDITIONS

- A. Environmental Requirements, General: Comply with requirements of referenced plaster application standards and recommendations of plaster manufacturer for environmental conditions before, during and after application of plaster.
- B. Protect contiguous Work from soiling, spattering, moisture deterioration and other harmful effects that might result from plastering.

PART 2 PRODUCTS

2.1 GENERAL

- A. All materials shall meet or exceed all applicable referenced standards, federal, state and local requirements, and conform to codes and ordinances of authorities having jurisdiction.

2.2 MANUFACTURER

- A. Subject to compliance with requirements, provide products of one of the following Manufacturers of metal supports and expanded metal lath and accessories:
  - 1. Gold Bond Building Products Div., National Gypsum Co.
  - 2. Milcor Division; Inrvco, Inc.
  - 3. United States Gypsum Co.
  - 4. Fry Reglet Corp.

2.3 METAL SUPPORTS FOR SUSPENDED AND FURRED CEILINGS:

- A. General: Size metal ceiling supports to comply with the following, unless otherwise indicated.
- B. Portland Cement Plaster Installation: ANSI A 42.3.
- C. Wire for Hangers and Ties: ASTM C 641, Class 1 zinc coating, soft temper.
- D. Channels: Cold-rolled steel, 0.0598" min. thickness of base metal (uncoated), allowable bending stress of 18,000 psi, protected with rust inhibitive paint or galvanizing complying with ASTM A 525 for B 60 coating designation, and as follows:
  - 1. Carrying Channels: 1-1/2" deep x 7/16" wide flanges, 475 lbs. per 1000' painted, 508 lbs. per 1000' galvanized.
  - 2. Furring Channels: 3/4" deep x 7/16" wide flanges, 300 lbs. per 1000' painted, 316 lbs. per 1000' galvanized.
    - a. Provide galvanized channels for exterior installations.
- E. Stud Thickness: 0.0341", unless otherwise indicated.
- F. Expanded Metal Lath: Fabricate expanded metal lath from uncoated or zinc-coated (galv.) steel sheet to produce lath complying with ASTM C 847 for type, configuration and other characteristics indicated below, with uncoated steel sheet painted after fabrication.
  - 1. Diamond Mesh Lath: Comply with the following requirements:
    - a. Configuration: Flat.
    - b. Weight: 3.4 lbs. per sq. yd.
- G. Lath Attachment Devices: Devices of material and type required by referenced standards and recommended by lath manufacturer for secure attachment of lath to framing members and or lath to lath.

#### 2.4 PLASTER ACCESSORIES FOR PORTLAND CEMENT PLASTER:

- A. General: Comply with material provisions of ANSI A42.3; coordinate depth of accessories with thickness and number of coats required.
- B. Metal Corner Reinforcement: Expanded large mesh diamond mesh lath fabricated for zinc-alloy or welded wire mesh fabricated from 0.0475" diameter zinc-coated (galv.) wire, and specially formed to reinforced external corners of portland cement plaster on exterior exposures while allowing full plaster encasement.
- C. Metal Corner Beads: Small nose corner beads fabricated from zinc alloy, with expanded flanges of large mesh diamond lath to allow full encasement by plaster.
- D. Casing Beads: Square-edge style, with expanded flanges and removable protective tape, of the following material:
  - 1. Material: Zinc Alloy.
- E. Control Joints: Prefabricated, of material and type indicated below:
  - 1. One-Piece Type: Folded pair of non-perforated screeds in M-Shaped configuration, with expanded flanges.

#### 2.5 PORTLAND CEMENT PLASTER MATERIALS:

- A. Portland cement, ASTM C 150, Type I or III.
- B. Masonry cement, ASTM C 91, Type N.

#### 2.6 FINISH COAT CEMENT: Type as indicated below:

- A. Portland cement, ASTM C 150, Type I, white.

- B. Masonry cement, ASTM C 91, Type N, White.

## 2.7 FACTORY-PREPARED FINISH COAT

- A. Manufacturer's standard product requiring addition of water only; white in color unless otherwise indicated.
- B. Product: Subject to compliance with requirements, provide Oriental Exterior Finish Stucco manufactured by United States Gypsum. Co.
- C. LIME: Special hydrated lime for finishing purposes, ASTM C206, Type S, or special hydrated lime for masonry purposes, ASTM C 207, Type S.
- D. Sand Aggregate for Base Coat: ASTM C 897.
- E. Aggregate for Finish Coats: ASTM C 897 and as indicated below.
  - 1. Manufactured or natural sand, white in color.
- F. **Final paint coats as per Section 09900 Paint and Coatings. Stucco colors to be determined at jobsite during mock-wall construction (Six (6) paint colors). Provide actual samples of finish and colors at jobsite. Samples shall be 2' x 2' and shall be done next to the mock up wall at the beginning of the project and be kept until the end of the project.**

## 2.8 MISCELLANEOUS MATERIALS:

- A. Water for mixing and finishing plaster: Drinkable, free of substances capable of affecting plaster set or of damaging plaster, lath or accessories.
- B. Bonding Agent for Portland Cement Plaster: ASTM C 932.
- C. Acoustical Sealant: ASTM C 919, non-oxidizing, skinning paintable types for exposure applications; non-drying, non-hardening, non-skinning type for concealed applications.

## 2.9 PORTABLE CEMENT PLASTER MIXES AND COMPOSITIONS:

- A. General: Comply with ASTM C 926 for portland cement plaster base and finish coat mixes as applicable to plaster bases, materials and other requirements indicated.
- B. Portland Cement Plaster Base Coat Mixes and Compositions: Portland materials for respective base coats in parts by volume for cementitious materials and in parts by volume per sum or cementitious materials for aggregates to comply with the following requirements for each method of application and plaster base indicated. Adjust proportions below within limits specified to attain workability.
  - 1. Three-Coat Work Over Metal Lath: Base coats as indicated below:
    - a. Scratch Coat: 1 part portland cement, 0-3/4 parts lime, 2-1/2 - 4 parts sand.
    - b. Brown Coat: 1 part portland cement, 0-3/4 parts lime, 3-5 parts sand.
- C. Factory-Prepared Portland Cement Finish Coats: Add water only comply with finish coat manufacturer's directions.
- D. Mixing: Mechanically mix cementitious and aggregate materials for plasters to comply with applicable referenced application standard and with recommendation of plaster manufacturer.

## PART 3 EXECUTION

- 3.1 PORTLAND CEMENT PLASTER LATHING AND FURRING INSTALLATION STANDARD:  
Install lathing and furring materials indicated for portland cement to comply with ANSI-A42.3.

- A. Install supplementary framing, blocking, and bracing at terminations in the work and for support of fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, and similar work to comply with details indicated or if not otherwise indicated, to comply with applicable published recommendations of gypsum plaster manufacturer, or if not available, of "Gypsum Construction Handbook" published by United States Gypsum Co.
- B. Isolation: Where lathing and metal support system abuts building structure horizontally, and where partition/wall work abuts overhead structure, isolate the work from structural movement sufficiently to prevent transfer of loading into the work from the building structure. Install slip or cushion type joints to absorb deflections but maintain lateral support.
  - 1. Frame both sides of control and expansion joints independently and do not bridge joints with furring and lathing or accessories.

### 3.2 PREPARATION AND COORDINATION

- A. Coordinate installation of ceiling suspension system with installation of overhead structural systems to ensure that inserts and other structural anchorage provisions have been installed to receive ceiling hangers in a manner that will develop their full strength and at spacings required to support ceiling.
- B. Hangers Installation: Attach hangers to structure above ceiling to comply with ML/SFA "Specifications for Metal Lathing and Furring" and with referenced standards.
  - 1. Do not attach hangers to metal deck tabs.
  - 2. Install ceiling suspension system components of sizes and spacings indicated but not in smaller sizes or greater spacings than that required by referenced lathing and furring installation standards.
- C. Carrying Channels: Space carrying channels not over 3'-0" o.c. with 4'-0" o.c. hanger spacing.
- D. Furring Channels to receive Metal Lath: Space furring channels not over 16" o.c. for 3.4 lb. diamond mesh lath or 24" o.c. for 3.4 flat rib lath.
- E. Furring Channels to receive Gypsum Lath: Space furring channels not over 16" o.c. for 3/8" thick, clip-attached gypsum lath, unless closer spacing indicated or required for fire resistance rated assembly.

### 3.3 INSTALLATION OF PLASTERING ACCESSORIES:

- A. General: Comply with referenced lathing and furring installation standards for provision and location of plaster accessories to type indicated. Miter or cope accessories at corners; install with tight joints and alignment. Attach accessories securely to plaster bases to hold accessories in place and alignment during plastering.
- B. Accessories for Gypsum Plaster: Provide the following types to comply with requirements indicated for location:
  - 1. Corner Beads: Install at external corners.
  - 2. Casing Beads: Install at termination of plaster work, except where plaster passes behind and is concealed by other work and where screeds, bases or metal frames and act casing beads.
  - 3. Control Joints: Install at locations indicated, or if not indicated, at spacings and locations required by referenced standard and recommended by plaster manufacturer and approved by the Architect.
- C. Accessories for Portland Cement Plaster

1. Corner Reinforcement: Install at external corners.
2. Corner Bead: Install at external corners.
3. Casing Beads: Install at terminations of plaster work unless otherwise indicated.
4. Control Joints: Install control joints at locations indicated or if not indicated, at locations complying with the following criteria and approved by the Architect.
5. Where an expansion or control joint occurs in surface of construction directly behind plaster membrane.
  - a. 10'-0" in either direction.

#### 3.4 PLASTER APPLICATION, GENERAL

- A. Prepare monolithic surfaces for bonded base coats and use molding compound or agent to comply with requirements of referenced plaster application standards for conditions of monolithic surfaces.
- B. TOLERANCES: Do not deviate more than 1/8" in 10'-0" from a true plane in finished plaster surfaces, as measured by a 10'-0" straightedge placed at any location on surface.
- C. Plaster flush with metal frames and other built-in metal items or accessories which act as a plaster ground, unless otherwise indicated. Where plaster is not terminated at metal by casing beads, cut base coat free from metal before plaster sets and groove finish coat at the junctures with metal.
- D. Apply thickness and number of coats of plaster as indicated; or as required by referenced standards.

#### 3.5 PORTLAND CEMENT PLASTER APPLICATION:

- A. Portland Cement Plaster Application Standard: Apply portland cement plaster materials, compositions, and mixes to comply with ASTM C 926.
- B. Number of Coats: Apply portland cement plaster, of composition indicated, to comply with the following requirements:
  1. Use three-coat work over the following plaster bases:
    - a. Metal lath.
  2. Painted Finish coat: Floated finish unless otherwise indicated; match Architect's sample for texture and color.
  3. Moist cure portland cement plaster base and finish coats to comply with ASTM C 926, including recommendations for time between coats and curing in "Annex A2 Design Considerations".

#### 3.6 CUTTING AND PATCHING:

- A. Cut, patch, point-up and repair plaster as necessary to accommodate other work and to restore cracks, dents and imperfections. Repair to replace work to eliminate blisters, buckles, excessive crazing and check cracking, dry-outs, efflorescence, sweat-outs and similar defects, and where bond to the substrate has failed.

#### 3.7 CLEANING AND PROTECTION:

- A. Remove temporary protection and enclosure of other work. Promptly remove plaster form door frames, windows, and other surfaces which are not to be plastered. Repair floors, walls and other surfaces which have not been stained, marred or otherwise damaged during the plastering work. When plastering work is completed, remove unused materials, containers and equipment and clean floors or plaster debris.



- B. Provide final protection and maintain conditions, in a manner suitable to Installer, which ensures plaster work being without damage or deterioration at time of substantial completion.

END OF SECTION

**DIVISION 9 FINISHES**  
**09250 GYPSUM BOARD WALL CONSTRUCTION**

PART 1 GENERAL

1.1 SUMMARY

- A. This section includes the following:
  - 1. Interior gypsum board
- B. Related Sections include the following:
  - 1. Division 6 Section 06100 Rough Carpentry for wood framing and furring that supports gypsum board.
  - 2. Division 7 Section 07210 Building Insulation for insulation and vapor retarders installed in assemblies that incorporate gypsum board.
  - 3. Division 9 Section 09900 Painting for primers applied to gypsum board surfaces.

1.2 SUBMITTALS

- A. Product Data: For each type of product specified
- B. Samples: For the following products:
  - 1. Textured Finishes: Manufacturer's standard size for each textured finish indicated and on same backing indicated for Work.
- C. Fire-Resistance Ratings: Provide gypsum drywall work with ratings indicated and conforming to assemblies tested and listed by recognized authorities.

1.3 STORAGE AND HANDLING

- A. Store materials inside under cover and keep them dry and protected against damage from weather, condensation, direct sunlight, construction traffic, and other causes. Stack panels flat to prevent sagging.

1.4 PROJECT CONDITIONS

- A. Comply with ASTM C 840 requirements or gypsum board manufacturer's written recommendations, whichever are more stringent.
- B. Do not install interior products 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 CEILING SUPPORT MATERIALS:

- A. MAIN RUNNERS: Steel; channels, hot or cold-rolled, size per ASTM C 754.
- B. HANGER WIRE: ASTM A 641, soft, class 1 galv.

- C. HAT-SHAPED FURRING CHANNELS: ASTM C 645.
  - 1. Where shown as "Resilient", provide manufacturer's special type designed to reduce sound transmission.
- D. FURRING MEMBER: ASTM C 645; 25-gauge C-shaped studs.
- E. DIRECT SUSPENSION SYSTEM: Zinc-coated or painted steel system of furring runners, furring tees and accessories designed for concealed support of screw- attached gypsum drywall ceilings.

## 2.2 WALL/PARTITION SUPPORT MATERIALS:

- A. STUDS AND RUNNERS: ASTM C 645, 0.0179" base metal thickness unless otherwise indicated.
- B. FURRING MEMBERS: ASTM C 645, 0.0179" base metal thickness, hat shaped.

## 2.3 DRYWALL MATERIALS

- A. EXPOSED GYPSUM BOARD: ASTM C 36.
  - 1. Provide type X where indicated and where required in fire resistance rated assemblies.
- B. LONG EDGES: Standard taper.
- C. THICKNESS: 1/4, 1/2, 5/8" unless otherwise indicated. (refer to plans for sizes)
- D. GYPSUM BACKING BOARD FOR MULTI-LAYER APPLICATIONS: ASTM C 442 or A 36.
- E. WATER-RESISTANT GYPSUM BACKING BOARD: ASTM C 630.
- F. EXTERIOR GYPSUM BOARD: ASTM C-1177.

## 2.4 TRIM ACCESSORIES

- A. Provide mfr's. standard metal trim accessories of the beaded type with face flanges for concealment in joint compound except where semi- finishing or exposed type is indicated. Provide corner beads, L-type edge trim beads, U-type trim beads, special L-kerf edge trim-beads, and one piece control beads.
- B. GYPSUM BOARD FASTENERS: Type recommended by gypsum board mfr., except as otherwise indicated.
- C. JOINT TAPE: ASTM C 475, paper reinforcing tape.
- D. JOINT COMPOUND: ASTM C 475, of the type indicated.
- E. Provide vinyl-tape power for interior work.
- F. Provide water-resistant type manufactured by United States Gypsum Co. for use with water-resistant backing board.
- G. Do not bridge building expansion joints with support systems, frame both sides of joint with furring and other supports as indicated.

## 2.5 WALL/PARTITION SUPPORTED SYSTEM

- A. Install steel studs with bottom and top runners tracks anchored to substrates. Isolate system from building structure to prevent transfer of loading and deflection into metal support system, both vertically and horizontally.
- B. Frame door and other openings with studs and runners and gauge, number and

arrangement to comply with manufacturer's recommendations for size of opening, weight of doors and height and stud size, unless otherwise indicated.

- C. Install supplementary framing, runners furring, blocking and bracing at openings and terminations in gypsum drywall and where required for support of other work which cannot be adequately supported on gypsum board alone.

## PART 3 EXECUTION

### 3.1 DRYWALL INSTALLATION AND FINISHING

- A. Install gypsum boards in lengths and directions which will minimize number of end joints, and avoid end joints in central area of ceilings. Install walls and partitions with exposed gypsum boards vertical, joints offset on opposite sides of partitions. Otherwise, install boards with edges perpendicular to supports, with end joints staggered over supports, except where recommended in a different arrangement by mfr.
- B. Form control joints with 1/2" space between boards. Install acoustical sealant at base of space, and apply trim accessory at face.

### 3.2 ACOUSTICAL SEALANT

- A. Where work is indicated as "sound retarding" or shown with an STC rating, apply acoustical sealant as recommended by mfr.
- B. Screw gypsum board to wood supports.
- C. Screw both layers to supports where double-layer work is indicated or otherwise required.

### 3.3 DRYWALL FINISHING

- A. Except as otherwise indicated, apply joint tape and joint compound at joints (both directions) between gypsum boards, Apply compound at accessory flanges, penetrations fastener heads and surface defects.
- B. Install compound in 3 coats (plus pre-fill of cracks where recommended by mfr.); sand after last 2 coats.

END OF SECTION

**DIVISION 9 FINISHES**  
**09900 PAINTS & COATINGS**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Interior and Exterior paints and coatings systems including: paint, stains, transparent coatings, and opaque finishes

1.2 RELATED SECTIONS

- A. Section 06200 – Finish Carpentry
- B. Section 07900 – Joint Sealants

1.3 REFERENCES

- A. SSPC-SP 1 - Solvent Cleaning
- B. SSPC-SP 2 - Hand Tool Cleaning
- C. SSPC-SP 3 - Power Tool Cleaning
- D. SSPC-SP 13 / NACE No. 6 Surface Preparation for Concrete
- E. EPA-Method 24
- F. OTC-Regulation No.41

1.4 SUBMITTALS

- A. Submit under provisions of Section 01340, Shop Drawings.
- B. Product Data: Manufacturer's data sheets on each paint and coating product should include:
  - 1. Product characteristics
  - 2. Surface preparation instructions and recommendations
  - 3. Primer requirements and finish specification
  - 4. Storage and handling requirements and recommendations
  - 5. Application methods
  - 6. Cautions
- C. Selection Samples: Submit a complete set of color chips that represent the full range of manufactures color samples available.
- D. Verification Samples: For each finish product specified, submit samples that represent actual product, color, and sheen.
- E. Coating Maintenance Manual: Upon conclusion of the project, the Contractor or paint manufacturer/ supplier shall furnish a coating maintenance manual, such as Sherwin-Williams "Custodian Project Color and Product Information" report or equal. Manual shall include an Area Summary with finish schedule, Area Detail designating where each product/ color/finish was used, product data pages, Material Safety Data Sheets, care and cleaning, and color samples of each color and finish used.

1.5 MOCK-UP

Include a mock-up if the project size and/or quality warrant taking such a precaution. The following is one example of how a mock-up on a large project might be specified. When

deciding on the extent of the mock-up, consider all the major different types of painting on the project.

- A. Finish surfaces for verification of products, colors, & sheens
- B. Finish area designated by Architect
- C. Provide samples that designate prime & finish coats
- D. Do not proceed with remaining work until the Architect approves the mock-up samples

#### 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Deliver manufacturer's unopened containers to the work site. Packaging shall bear the manufacturer's name, label, and the following list of information:
  - 1. Product name, and type (description)
  - 2. Application & use instructions
  - 3. Surface preparation
  - 4. VOC content
  - 5. Environmental issues
  - 6. Batch date
  - 7. Color number
- B. Storage: Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction. Store materials in an area that is within the acceptable temperature range, per manufacturers instructions. Protect from freezing.
- C. Handling: Maintain a clean, dry storage area, to prevent contamination or damage to the coatings.

#### 1.7 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not apply coatings under environmental conditions outside manufacturer's absolute limits.

### PART 2 PRODUCTS

#### 2.1 MANUFACTURERS

- A. All materials used under painting contract shall be manufactured by The Sherwin Williams Company, or approved equal products of the following manufacturer, and shall be delivered to the job site in the original sealed containers.
  - 1. Sherwin Williams
  - 2. Pratt & Lambert
  - 3. Benjamin Moore
- B. Substitutions: Requests for substitutions will be considered in accordance with provisions of Section 01010 Summary of Work. When submitting request for substitution, provide complete product data specified above under Submittals, for each substitute product.

#### 2.2 COLORS AND SAMPLES

- A. Paint colors shall be selected by Architect. The Architect will furnish the painting contractor with color chips and a painting schedule showing where the various colors will go. Before any work is done, the contractor will then prepare color and texture samples on the job for the architect's approval.

## 2.3 SCOPE OF WORK

- A. The work done by the Painting Contractor shall include the Furnishings of all material, labor, tools and equipment required to complete the surface preparation, the painting, and the finishing of the building(s), as specified herein.
- B. See drawings and schedules for type and location of various surfaces requiring paint or finishing.
- C. Field painting will not be required on items specified to be completely finished at factory or any non-ferrous metals, unless specifically designated.
- D. Do not include prime coats on ferrous non-structural metal delivered with prime or shop coats, already applied. However, all abrasions on such prime coats shall be touched up with primers.

## 2.4 WORKMANSHIP AND APPLICATION

- A. All work shall be done in a workmanlike manner by skilled mechanics and executed in accordance with manufacturer's printed instructions.
- B. All materials shall be properly applied, and shall be free from runs or sags.
- C. No exterior paint shall be applied in temp. below 50 Deg F. and all surfaces shall be thoroughly dry. Follow manufacturer's printed recommendations for drying time before succeeding coats maybe applied.
- D. No interior painting or finishing shall be permitted until the Architect so authorizes. Follow manufacturer's printed recommendations for drying time before succeeding coats may be applied.
- E. Varnishes and enamels shall be lightly sanded and then dusted before succeeding coats may be applied.
- F. Paint one coat on the top and bottom edges of all doors, both metal and wood after doors have been fitted.

## 2.5 MATERIALS – GENERAL REQUIREMENTS

- A. Paints and Coatings – General:
  - 1. Unless otherwise indicated, provide factory-mixed coatings. When required, mix coatings to correct consistency in accordance with manufacturer's instructions before application. Do not reduce, thin, or dilute coatings or add materials to coatings unless such procedure is specifically described in manufacturer's product instructions.
- B. Primers:
  - 1. Where the manufacturer offers options on primers for a particular substrate, use primer categorized as "best" by the manufacturer.

## 2.6 ACCESSORIES

- A. Coating Application Accessories:
  - 1. Provide all primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials required, per manufacturer's specifications.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A Do not begin application of coatings until substrates have been properly prepared. Notify Architect of unsatisfactory conditions before proceeding.
- B If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- C Proceed with work only after conditions have been corrected and approved by all parties, otherwise application of coatings will be considered as an acceptance of surface conditions.

### 3.2 SURFACE PREPARATION:

- A. Proper product selection, surface preparation and application affect coating performance. Coating integrity and service life will be reduced because of improperly prepared surfaces. Selection and implementation of proper surface preparation ensures coating adhesion to the substrate and prolongs the service life of the coating system.
- B. Selection of the proper method of surface preparation depends on the substrate, the environment, and the expected service life of the coating system. Economics, surface contamination, and the effect on the substrate will also influence the selection of surface preparation methods.
- C. The surface must be dry and in sound condition. Remove oil, dust, dirt, loose rust, peeling paint or other contamination to ensure good adhesion.
- D. Preparing Block and Concrete Construction: Poured concrete or precast concrete surfaces should cure 60-90 days; block construction for 30-60 days before painting; upon prevailing climatic conditions. Before painting new concrete surfaces, the presence of form release agents and laitance deposits must be considered. In the event form oils or waxes are present, sand-blasting or a thorough washing with a detergent solution will be necessary to assure good adhesion.
- E. Laitance must be removed by wirebrushing or Brush-Off Blast Cleaning. Poured concrete floors must be etched with a 10% solution of muriatic acid in water to dissolve the laitance and open the pores to allow the penetration of the coating. Caution: Wear rubber boots and gloves, work goggles and protective clothing.
- F. Peeling and scaling, is often caused from painting over heavy chalk deposits that have not been properly removed. Remove this substance with high pressure spray equipment. If mildew is present, it can be killed and removed at the same time with a mildewcide solution.
  - 1. Efflorescence is a white deposit that frequently appears on exterior or interior masonry. To remove, first dampen the wall with water, then scrub the surface with a 10% solution of muriatic acid. Caution: Wear rubber boots and gloves, work goggles and protective clothing. After treatment, thoroughly flush the surface with clean water to remove all acid.
- G. The painting contractor shall be wholly responsible for the finish of his work, and shall not commence any part of it until the surface is in proper condition. If painting contractor considers any surface unsuitable for proper finish of his work, he shall notify the Architect of this fact, and shall not apply any until the unsuitable surfaces have been made satisfactory, or the Architect has instructed him to proceed.
- H. All knots or sappy spots shall be sealed before painting. After interior prime coats have been applied, all remaining necessary putting or spackling of nail holes, cracks and blemishes shall be done. All patch areas shall then be primed.
- I. All metal surfaces shall be solvent cleaned to remove grease and oil before painting.



Also, all metal surfaces shall have loose rust and scale removed before painting. New galvanized iron surfaces shall be primed with Sherwin Williams Pro-Cryl Metal Primer or approved equal after thorough cleaning as described above.

### 3.3 INSPECTION

- A. Notify the Architect so that each coat of material is inspected and approved by the Architect before the application of each succeeding specified coat, otherwise no credit for the coat applied will be given, and the contractor automatically assumes responsibility to recoat the work in question.

### 3.4 PROTECTION OF PROPERTY

- A. The painting contractor shall be responsible for the condition of building in his charge. He shall protect adjacent work and materials from soiling or damage as well as his own.
- B. When work is completed, the painting contractor shall remove all surplus materials, scaffolds, etc. from the premises, and shall clean off all misplaced paint, varnish, etc. so as to leave the premises in good condition.

### 3.5 SCHEDULE

- A. The following schedule is not intended to mention every particular item required to be painted, but it is intended to establish type and number of coats required on various materials

#### **Interior Wood Trim 4 coats Stain Varnish Satin Finish**

1. First Coat-Sherwin Williams Paste Wood Filler, if open grain wood.
2. Second Coat- Sherwin Williams Wood Classic Stain
3. Third Coat & Fourth Coats- Sherwin Williams Wood Classic Polyurethane Varnish (Satin)

Note: On Close Grain Wood, Paste wood filler may be eliminated.

#### **Exterior wood, Gloss – 3 coats**

1. First Coat Primer- Sherwin Williams A-100 Alkyd Exterior Primer
2. Second Coat- Sherwin Williams A-100 Gloss house paint
3. Third coat- Sherwin Williams A-100 Gloss House paint

#### **Interior Dry Wall- 3 coats Eg-Shel Enamel**

1. First Coat- Sherwin Williams Pro Mar 200 Latex Wall Primer
2. Second and Third Coats- Sherwin Williams Pro Mar 200 Zero VOC Latex Eg-Shel Enamel

#### **Interior Metal- 2 coats- Eg-Shel Enamel**

1. First Coat Shop Primed
2. Second Coat-Sherwin Williams Pro Industrial Pro-Cryl Universal Primer
3. Third Coat-Sherwin Williams Pro Industrial Pre-Catalyzed Waterbased Epoxy Semi-Gloss

#### **Exterior Exposed Steel/ 3 coats**

1. First Coat-Sherwin Williams Pro Industrial Pro-Cryl Universal Primer
2. Second Coat & Third Coats- Sherwin Williams Pro Industrial Urethane Alkyd Enamel

#### **Interior Concrete Masonry Units**

1. Prime Coat-Sherwin Williams Heavy Duty Block Filler or Loxon Block Surfacers
2. Second and Third Coat – Sherwin Williams Pro Industrial Pre-Catalyzed Waterbased Epoxy Semi-Gloss

#### **Exterior Concrete Masonry Units**

1. Prime Coat – Sherwin Williams Loxon XP Waterproofing Coating
2. Second and Third Coat – Sherwin Williams Loxon XP Waterproofing Coating

#### **Interior & Exterior, Concrete Floors – 2 coats**

If smooth hard-trowelled, should be etched with 10% solution of Muriatic Acid, then flushed with water and allowed to dry thoroughly.

1. Prime Coat – Sherwin Williams H&C Silicone Acrylic Concrete Stain
2. Second and Third Coat – Sherwin Williams H&C Silicone Acrylic Concrete Stain

Note: Do not use stain on previously painted surfaces, but in all cases provide two (2) new coats of paint.

#### **Concrete Floors (RESTROOM FLOORS ONLY) – 2 coats**

1. First Coat- Sherwin Williams Armorseal 8100 Epoxy B70-8100 Series (with Sharkgrip Slip Resistant Additive)
2. Second coat- Sherwin Williams Armorseal 8100 Epoxy B70-8100 Series (with Sharkgrip Slip Resistant Additive)

#### **Exterior Stucco – 3 coats**

1. First Coat- Sherwin Williams Loxon Exterior Primer
2. Second and Third coats- Sherwin Williams A-100 Flat

### **3.6 EXTRA PAINT/VARNISHES**

- A. Provide owner with 5 gallons of each paint color used on the job. Also provide one quart of each type of varnish, sealer, stain, etc.

### **3.7 PREPARATION OF EXISTING MATERIALS**

- A. Clean existing walls and surfaces as per Sherwin Williams. Specifications and numbering system shown below.
  1. Masonry Walls: S-W3, or S-W4, and S-W12  
S-W6 C or D at interiors.
  2. Asbestos Siding: S-W2 and S-W12
  1. Concrete Floors and Walls: S-W5 (ASTM-D 4259, blast cleaning or ASTM-D4 260 acid etching).
  4. Dry Wall: S-W8 and S-W12
  5. Previously Coated Surfaces: S-W12
  6. Steel: S-W12 and S-W15
  7. Stucco: S-W22 and S-W12
  8. Exterior Wood: S-W23 and S-W12
  9. Interior Wood: S-W24 and S-W12
  10. Galvanized Metal: S-W10 and S-W13, S-W21

END OF SECTION

**DIVISION 10 SPECIALTIES**  
**10160 TOILET PARTITIONS (SOLID PLASTIC)**

PART-1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, include General and Supplementary Conditions and Division-Specification section, apply to work of this section.

1.2 SUBMITTALS

- A. Plastic compartment work includes the following, where indicated:
  - 1. Floor-mounted **overhead braced** compartments.
- B. Furnish all labor and materials necessary for the completion of work in this section as shown on the contract drawings and specified herein.
- C. Work in this section shall include, but is not limited to:
  - 1. Toilet compartments, compartment doors, urinal screens, privacy screens and entry partitions.
  - 2. Hardware for toilet compartments and plastic partitions.
  - 3. Shop drawings and working drawings.
  - 4. Manufacturer's guarantee.
- D. Submit shop drawings for fabrication and erection of toilet partition assemblies not full described by production drawings, templates, and instructions for installation of anchorage devices built into other work.
- E. Related work specified elsewhere shall include accessories and anchorage/blocking for attachment of partitions.

1.3 PRODUCT DATA

- A. Submit six (6) sets of shop drawings and details for architect's approval.
- B. Colors shall be selected from the manufacturer's full range of colors.
  - 1. Solid plastic, homogenous color. Speckled pattern
- C. Color samples and hardware samples shall be submitted for approval by the architect upon request.
- D. Submit manufacturer's detailed technical data for materials, fabrication, and installation, including catalog cuts of anchors, hardware, fastenings, and accessories.

1.4 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: A company regularly engaged in manufacture of products specified in this section, and whose products have been in satisfactory use under similar service conditions for not less than 5 years.
- B. Installer's Qualifications: A Company or Individual, regularly engaged in installation of products specified in this Section, with a minimum of 5 years experience.
- C. Field Measurements: Take field measurements prior to preparation of shop drawings and fabrication where possible, to ensure proper fitting of work. However, allow for adjustments within specified tolerances wherever taking of field measurements before

fabrication might delay work.

- D. Coordination: Furnish inserts and anchorages which must be built into other work for installation of toilet partitions and related work; coordinate delivery with other work to avoid delay.

## 1.5 WARRANTY

- A. Manufacturer shall guarantee its plastic against breakage, corrosion, and delamination under normal conditions for 25 years from the date of receipt by the customer. If materials are found to be defective during that period for reasons listed above, the materials will be replaced free of charge. (Labor not included in warranty.)

## PART 2 PRODUCTS

### 2.1 MANUFACTURER

- A. Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work include, but are not limited to, the following:
  1. Scranton Products (Santana/Comtec/Capitol)
  2. Ampco Products Inc.
  3. Bradley Corporation
  4. Columbia Partitions, Inc.
  5. Global Steel Products Corp.
  6. American Sanitary Partition Co.
  7. Accurate Partitions
  8. or approved equal.

### 2.2 MATERIALS

- A. General: Provide materials which have been selected for surface flatness and smoothness. Exposed surfaces which exhibit pitting, seam marks, roller marks, stains, discoloration, telegraphing of core material, or other imperfections on finished units are NOT ACCEPTABLE.
- B. Doors, panels and pilasters shall be 1" thick constructed from High Density Polyethylene (HDPE) resins with homogenous color, speckled pattern throughout. Partitions shall be fabricated from polymer resins compounded under high pressure, forming a single component which is waterproof, nonabsorbent and has a self-lubricating surface that resists marks from pens, pencils, markers and other writing instruments. All plastic components shall be covered with a protective plastic masking.
- C. Provide materials not less than 1" thick, seamless construction with edges eased.

### 2.3 CONSTRUCTION

- A. Doors, panels, and pilasters shall be 1" thick with all edges rounded to a radius.
- B. Doors and dividing panels shall be 55" high and mounted at 14" above the finished floor. An aluminum heat sink may be fastened to the bottom edges (optional).
- C. Unless otherwise indicated, furnish 24" wide in-swing doors for ordinary toilet stalls and 32" wide (clear opening) out-swing doors at stalls equipped for use by handicapped.
- D. Pilasters shall be 82" high (standard) and fastened into a 3" high pilaster shoe with a stainless steel tamper resistant torx head sex bolt.

## 2.4 HARDWARE

- A. Door hardware shall be as noted:
1. Pivot self-closing hinges shall be 8" and fabricated from heavy-duty extruded aluminum (6463-T5 alloy) with bright dip anodized finish with wrap-around flanges, through bolted to doors and pilasters with stainless steel, torx head sex bolts. Hinges operate with field adjustable nylon cams. Cams shall be field set in 30-degree increments up to 90 deg.
  2. Door strike/keeper shall be 6" long and made of heavy-duty extruded aluminum (6436-T5 alloy) with a bright dip anodized finish and secured to the pilasters with stainless steel tamper resistant torx head sex bolts. Bumper shall be made of extruded black vinyl.
  3. Latch and housing shall be made of heavy-duty extruded aluminum (6463-T5 alloy). The latch housing shall have a bright dip anodized finish, and the slide bolt and button shall have a black anodized finish.
  4. Each door shall be supplied with one coat hook/bumper and door pull made of chrome plated zamak. Handicapped and ambulatory stall doors shall be supplied with a second door pull and out swing doors with one door stop made of chrome plated zamak. Doors at handicap stall and ambulatory stall shall be self closing.
- B. Pilaster shoes shall be 3" high (type 304, 20 gauge) stainless steel. Pilaster shoes shall be secured to the pilaster with a stainless steel tamper resistant torx head sex bolt.
1. Furnish shoe at each pilaster to conceal supports and leveling mechanism.
- C. **Continuous heavy duty stainless steel wall brackets** are pre-drilled. Wall brackets are mounted with stainless steel, vandal-resistant screws. The attachment of brackets to the adjacent wall construction shall be accomplished with 2½" stainless steel vandal resistant screws and plastic anchors.
- D. Overhead Bracing: Headrail shall be made of heavy-duty extruded aluminum (6463-T5 alloy) with anti-grip design and integrated curtain track. The headrail shall have a clear anodized finish and shall be fastened to the headrail bracket by a stainless steel tamper resistant torx head sex bolt, and fastened at the top of the pilaster with stainless steel tamper resistant torx head screws.
- E. Headrail brackets shall be 20 gauge stainless steel with a satin finish and secured to the wall with a stainless steel tamper resistant torx head screws.
- F. Anchorages and Fasteners: Manufacturer's standard exposed fasteners and concealed anchors of stainless steel.

## 2.5 FABRICATION:

- A. GENERAL: Furnish standard doors, panels, screens, and pilasters fabricated for partitions systems, unless otherwise indicated. Furnish units with cutouts, drilled holes, and internal reinforcement to receive partition-mounted hardware, accessories, and grab bars, as indicated.
- B. Overhead braced partitions: Furnish galvanized steel supports and leveling bolts at pilaster, as recommended by manufacturer to suit floor conditions. Make provisions for setting and securing continuous extruded aluminum anti-grip overhead-bracing at top of each pilaster.
- C. Secure pilasters to floor and level, plumb, and tighten installation with devices furnished. Secure overhead-brace to each pilaster with not less than two fasteners. Hang doors

and adjust so that tops of doors are parallel with overhead-brace when doors are in closed position. Urinal partitions shall also be overhead braced.

- D. Wall-hung screen: Furnish panel units in sizes indicated, of same construction and finish as partitions system panels.

### PART 3 EXECUTION:

#### 3.01 PREPARATION

- A. Examine areas to receive toilet partitions, screens, and shower compartments for correct height and spacing of anchorage/blocking and plumbing fixtures that may affect installation of partitions. Report any discrepancies to the architect.
- B. Take complete and accurate measurements of complete toilet compartment locations.

### INSTALLATION:

#### 3.2 INSTALLATION

- A. General: Comply with manufacturer's recommended procedures and installation sequence.
- B. Install partitions and screens rigid, straight, plumb, and level manor, with plastic laid out as shown on shop drawings and manufacturer's installation instructions.
- C. All doors and panels to be mounted at 14" above finished floor.
- D. Clearance at vertical edges of doors shall be uniform top to bottom and shall not exceed 3/8".
- E. Provide clearances of not more than 1/2" between pilaster and panels, and not more than 1" between panels and walls. Secure panels to walls with not less than continuous stirrup brackets. Secure panels to pilaster with not less than two stirrup brackets located to align with stirrup brackets at wall. Secure panels in position with manufacturer's recommended anchoring devices.
- F. Screens: Attach with concealed anchoring devices, as recommended by manufacturer to suit supporting structure. Set units to provide supports and to resist lateral impact.
- G. Locate holes for wall anchorages in masonry or tile joints. No evidence of cutting, drilling, and/or patching shall be visible on the finished work.
- H. Finished surfaces shall be cleaned after installation and be left free of all imperfections.

#### 3.3 ADJUST AND CLEAN:

- A. **HARDWARE ADJUSTMENT:** Adjust and lubricate hardware for proper operation. Set hinges on in-swing doors to hold open approximately 30 deg. from closed position when unlatched. Set hinges on out-swing doors (and entrance swing doors) to return to fully closed position.
- B. Clean exposed surfaces to partitions systems using materials and methods recommended by manufacturer, and provide protection as necessary to prevent damage during remainder of construction period.

END OF SECTION

**DIVISION 10 SPECIALTIES**  
**10440 SPECIALTY SIGNS**

**PART 1 GENERAL**

**1.1 SUBMITTALS**

- A. In addition to manufacturer's product data and installation instructions, submit the following:
- B. Shop Drawings for each type of specialty sign required. Include plans, elevations, and sign lettering layout; show anchorages and accessory items.
- C. Samples of each sign form and material showing finishes, colors, surface texture and qualities of manufacturer.

**1.2 MANUFACTURERS**

- A. Manufacturers: Subject to compliance with requirements, provide products of one of the following or an approved equal:
  - 1. Southwell Co., San Antonio, TX. (A.D.A. tactile signage)
  - 2. Metallic Arts, 1-800-541-3200
  - 3. Mohawk Signs Systems, 518-842-5303
  - 4. APCO Architectural Signs, Arlington, TX 1-817-483-0075
  - 5. Bayuk Graphic Systems, Inc., 717-442-0274

**PART 2 PRODUCTS**

**2.1 INTERIOR SIGNAGE**

- A. Single-ply modified acrylic (matte non-glare): Engraving stock with face and core plies in contrasting colors, in finishes and color combinations as selected by Architect.
  - 1. Sign Size: Refer to sizes listed below.  
Beveled edges
- B. Character Proportion. Letters and numbers on signs shall have width-to-height ratios and a stroke width-to-height ratios as per the new requirements for interior signage from the new ADA 2012.
- C. Raised and Brailled Characters and Pictorial Symbols: Letters, numbers, symbols, or pictographs on signs shall be raised accompanied with Grade 2 Braille at least 1/32 inch (80 mm). Characters or symbols shall be at least 5/8 inch (16 mm) high. Indented characters or symbols shall have a stroke width of at least 1/4 inch (6mm).
- D. Pictograms are to be located within a 6" vertical void. No characters or braille can be located within this field. Text descriptors are to be located directly below the pictogram. Use standard International symbols.

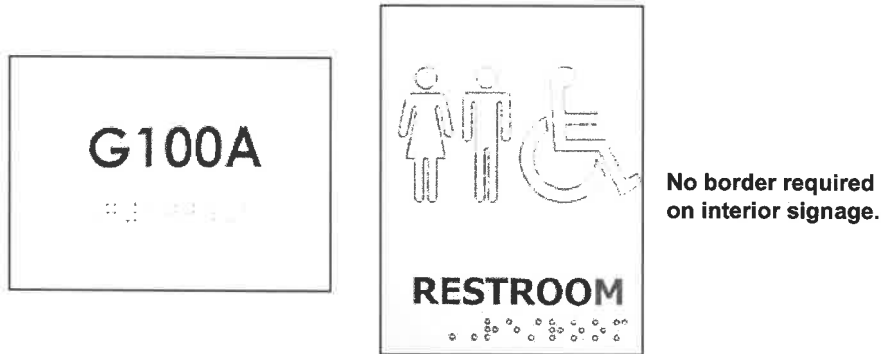


2.2 SCHEDULE

A. Provide one door sign for each room unless otherwise indicated below where multiple signs will be needed for a particular room.

(NAME)	(QUANTITY)	(SIZE)
CONCESSION	1	6" x 8"
STORAGE	1	"
EXIT	1	"
AUTHORIZED PERSONNEL ONLY	1	"
MEN (w/ wheelchair & man symbol)	1	"
WOMEN (w/ wheelchair & woman symbol)	1	"

**SAMPLE INTERIOR SIGNAGE**



2.3 EXTERIOR BUILDING LETTERS

A. Cast Aluminum Baked Enamel Letters

1. Letters shall be flush mount (FM).
2. Name: CITY OF HIDALGO VALLE ALTO PARK
3. Address: 12345 Street Name (8" high letters)
4. Size: 12" high letters (1.5" deep)
5. Style: Roman

B. Provide samples of material showing finishes, colors, surface texture and qualities of manufacturer.

2.4 BUILDING PLAQUE

A. Cast Aluminum, Double Line Border, Engraved Letters on Raised Strip, 18" x 26" (Aluminum) tablet shall be manufactured by The Southwell Company, MetallicArts or approved equal. Tablet is to be cast of virgin ingots (F-214 Aluminum Alloy). Casting shall be free of pits and gas holes and all letters shall be sharp and hand tooled. Border and faces of raised letters are to be a satin finish and background is to be leatherette texture.



- B. ALUMINUM TABLET: Background shall be sprayed with acrylic lacquer (natural aluminum finish). Plaque shall be chemically cleaned and etched and treated with alodine. Two coats of clear acrylic lacquer shall be sprayed on completed plaque.
- C. Contractor will furnish Architect with rubbing of actual pattern for approval prior to casting.
- D. Plaque template will be provided during the submittals phase.

## PART 3 EXECUTION

### 3.1 INSTALLATION

- A. Locate sign units and accessories where shown and scheduled, using mounting method of the type described and to comply with manufacturer's instructions. Install sign units level, plumb and at the height indicated.
- B. Wall Mounted Panel Signs: Attach panel signs to wall surfaces using the methods indicated below:
  - E. Screw Mounted: Install with (4) 1" S.S. screws (provide inserts where required) one at each corner of sign.
  - F. Provide a backing (dummy plate/film) if the sign is mounted on a window. The tape should not be visible from the inside of the window.
- G. Mounting Height and Location. Room identification signs shall be mounted on the wall surface on the handle side of doors at approximately 60 inches (152 cm) above the floor and within 8 inches (20 cm) from the inside edge of the door frame. Where it is appropriate for tactile signage to be used for purposes other than room or space identification, the characters and symbols shall be placed to the left of the feature to be identified.

END OF SECTION

**DIVISION 10 SPECIALITIES**  
**10522 FIRE EXTINGUISHERS**

PART 1 GENERAL

1.1 SUMMARY

- A. Perform all work required to complete the fire extinguishers indicated by the contract documents and furnish all supplementary items necessary for their proper installation.
- B. This section includes the following:
  - 1. Fire Extinguishers
  - 2. Fire Extinguisher cabinets
  - 3. Mounting brackets

1.2 SUBMITTALS

- A. Submit product data and finish samples for each type of product specified. For cabinets include rough-in dimensions, details showing mounting methods, relationship of box and trim to surrounding construction, door hardware, cabinets type and materials, trim style, door construction, panel style, and materials.

1.3 QUALITY ASSURANCE

- A. Single Source Responsibility: Obtain fire extinguishers and cabinets from one source from a single manufacturer.
- B. UL Listed Products: Fire extinguishers UL listed and bear UL "Listing Mark" for type, rating, and classification of extinguisher.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Subject to compliance with requirements, provide products by one of the following:
  - 1. J.L. Industries
  - 2. Larsen's Manufacturing Co.
  - 3. Seco Mfg., Inc.
  - 4. Potter Roemer
  - 5. Muckle Manufacturing, Division of Technico, Inc.
  - 6. American Specialties Inc.
  - 7. or approved equal

2.2 FIRE EXTINGUISHERS

- A. Provide fire extinguishers, cabinet and accessories for each fire extinguisher.
  - 1. Multi-Purpose Dry Chemical Type: UL-rated 4-A: 60-B.C, 10 lb. nominal capacity, in aluminum container, color to match aluminum store front doors. (Re: drawings on door elevations). **Refer to floor plans for locations and quantities.**
  - 2. Class K fire extinguishers (designed for commercial kitchens) in aluminum cabinet. **Provide at serving line and kitchen. Refer to floor plans for locations and quantities.**
  - 3. In addition to, provide one (1) fire extinguisher at each mezzanine (if any) and

provide one (1) at each electrical room and mechanical room. Fire extinguishers at all mechanical, electrical and mezzanine rooms can be wall mounted.

## 2.3 FIRE EXTINGUISHER CABINETS

- A. Provide the following (manufacturer's standard accessories) accessories for each fire extinguisher.
- B. Semi-Recessed Cabinet Type: Cabinet box partly recessed in wall. Cabinet cannot protrude more than 4".
- C. Bubble Type Door Style: One-piece molded plastic.
- D. Fastener Bracket: Quick release fastener anchored to cabinet
- E. Factory Finishing of Fire Extinguisher Cabinets: Comply with NAAMM "Metal Finishes Manual" to provide uniformly finished products.
- F. Provide color as indicated, or if not indicated, as selected from manufacturer's standard colors. Cabinet color to match aluminum store front doors (Re: drawings on door elevations) Refer to plans for wall types (ie: gypsum or CMU)

## 2.4 MOUNTING BRACKETS

- A. Provide brackets to prevent accidental dislodgement of extinguisher, or sizes required for type and capacity of extinguisher indicated in plated finish.
  - 1. Provide brackets for extinguishers not located in cabinets.

## PART 3 EXECUTION

### 3.1 INSTALLATION

- A. Installation: In accordance with manufacturer's directions for type of mounting required at height and locations indicated, or if not indicated, to comply with applicable regulations of governing authorities.
- B. Identify Fire Extinguisher in Cabinets with lettering spelling "FIRE EXTINGUISHER" printed on door by process indicated below, as selected by Architect from manufacturer's standard letter sizes, styles, colors and layouts.

END OF SECTION

**DIVISION 10 SPECIALTIES**  
**10800 TOILET AND BATH ACCESSORIES**

**PART 1 GENERAL**

**1.1 SUBMITTALS**

- A. Product Data: For each type of product indicated, Include the following:
  - 1. Manufacturer's data and installation instructions.
  - 2. Construction details and dimensions
  - 3. Anchoring and mounting requirements, including requirements for cutouts in other work and substrate preparation.
  - 4. Material and finish descriptions
  - 5. Features that will be included for Project
  - 6. Manufacturer's warranty
- B. Product Schedule: Indicating types, quantities, sizes and installation locations by room of each accessory required.
  - 1. Identify locations using room designations indicated
  - 2. Identify products using designations indicated.
- C. Maintenance Data: For toilet and bath accessories to include in maintenance manuals.
- D. Warranty: Sample of special warranty

**1.2 COORDINATION**

- A. Coordinate accessory locations with other work to prevent interference with clearances required for access by people with disabilities, and for proper installation, adjustment, operation cleaning and servicing of accessories.
- B. Deliver inserts and anchoring devices set into concrete or masonry as required to prevent delaying the work.
- C. Transmit all keys to Owner (**City of Hidalgo, Attention: Robert Segura**), by Registered Mail, return receipt requested or delivered personally with a transmittal letter. Provide itemized list of items delivered to Architect along with copy of signature of the returned receipt or transmittal letter for our records.

**PART 2 PRODUCTS**

**2.1 MANUFACTURERS**

- A. Manufacturers offering products to comply with requirements for general toilet and bath accessories include the following:
  - 1. Bobrick Washroom Equipment, Inc.
  - 2. Bradley Corporation
  - 3. American Specialties
  - 4. or approved equal

**2.2 MATERIALS**

- A. General: Provide toilet and bath accessories as indicated on schedule. Install units at locations and heights as indicated, plumb and level, firmly anchored, in accordance with manufacturer's instructions.
- B. Stainless Steel: AISI Type 302/304, with polished No.4 finish, 22 gauge minimum, unless other indicated.

C. SCHEDULE: Provide the following accessories or approved equal.

1. Grab Bars: (1 each per handicapped toilet stall)  
Stainless Steel Assist Equipment: Grab bars for handicapped person toilets  
Bobrick No. 6806.99x42, 6806.99x36, 6806.99x24 stainless steel grab bars with polished finish gripping surface. Size 1½" o.d. x 18" gauge wall, with intermediate support. Refer to plans for locations.
2. Toilet Tissue Dispenser: Bobrick B-274 (two roll) @ masonry & solid partitions.  
Non restrictive at H/C toilets
3. Coat Hooks: (1 per stall) Sanymetal #7810 @ ea. stall. Install at H/C height for elementary and adult (refer to drawing for actual application).
4. Air Hand Dryer: (Recessed hand dryers) #B-750 Automatic Handcraft as Manufacturer by Bobrick. (Color White) Quantity: Refer to Drawings (min. one per lav. complete w/ ele. connections typ.) Re: Electrical for electrical type.
5. Soap Dispenser: Soap Dispenser: Bobrick B2111 (s.s. one per lav.) at wall hung lavatories and sanitary hand sinks at kitchen. Maximum for to operate shall be 5 lbs.
6. Mirrors (one per lav) Unless otherwise specified on drawings provide the following mirrors: ¼" Tempered glass  
Height to top of mirror shall be 74" A.F.F. and the height to bottom of reflective surface shall be as per drawings **Sheet G2.0 Detail 26**.
7. Towel Dispenser and Waste receptacles: Bobrick B369 one per toilet facility.  
Including single toilet restrooms. Refer to plans for quantity and location.
8. Towel Dispenser: Bobrick B359. Refer to plans for location. (One per sanitary hand sinks at kitchen.)
9. Mop hanger Bobrick B239 one per janitor closet unless otherwise specified in plumbing schedule with mop sink.

### PART 3 EXECUTION

#### 3.1 INSTALLATION

- A. Install toilet accessory units in accordance with manufacturer's instructions, using fasteners appropriate to substrate and recommended by manufacturer of unit. Install units plumb and level, firmly anchored in locations indicated. Toilet paper holders shall be mounted on masonry wall whenever possible.

#### 3.2 ADJUSTING AND CLEANING

- A. Adjust toilet accessories for proper operation and verify that mechanisms function smoothly.
- B. Replace damaged or defective items.
- C. Clean and polish all exposed surfaces after removing protective coatings.

END OF SECTION

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END OF SECTION



09-10-18

A handwritten signature in cursive script, appearing to read "Miguel Chanin".

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Chanin Engineering, LLC

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SECTION 03 10 00

CONCRETE FORMS AND ACCESSORIES

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
  - 1. Formwork for cast-in place concrete.
  - 2. Shoring, bracing, and anchorage.
  - 3. Architectural form liners.
  - 4. Form accessories.
  - 5. Form stripping.
  
- B. Related Sections:
  - 1. Section 032000 - Concrete Reinforcement.
  - 2. Section 033000 - Cast-in-Place Concrete.

1.2 REFERENCES

- A. American Concrete Institute:
  - 1. ACI 117 - Standard Specifications for Tolerances for Concrete Construction and Materials.
  - 2. ACI 301 - Specifications for Structural Concrete.
  - 3. ACI 318 - Building Code Requirements for Structural Concrete.
  - 4. ACI 347 - Guide to Formwork for Concrete.
  
- B. American Forest and Paper Association:
  - 1. AF&PA - National Design Specifications for Wood Construction.
  
- C. The Engineered Wood Association:
  - 1. APA/EWA PS 1 - Voluntary Product Standard for Construction and Industrial Plywood.
  
- D. ASTM International:
  - 1. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
  - 2. ASTM E96 - Standard Test Methods for Water Vapor Transmission of Materials.
  
- E. West Coast Lumber Inspection Bureau:
  - 1. WCLIB - Standard Grading Rules for West Coast Lumber.

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### 1.3 DESIGN REQUIREMENTS

- A. Design, engineer and construct formwork, shoring and bracing in accordance with ACI 318 to conform to design and applicable code requirements to achieve concrete shape, line and dimension as indicated on Drawings.

### 1.4 PERFORMANCE REQUIREMENTS

- A. Vapor Retarder Permeance: Maximum .03 perms when tested in accordance with ASTM E96, Procedure A.

### 1.5 QUALITY ASSURANCE

- A. Perform Work in accordance with ACI 347 ACI 301 ACI 318.
- B. For wood products furnished for work of this Section, comply with AF&PA.
- C. Perform Work in accordance with State Municipality of Highways Public Work's standard.

### 1.6 COORDINATION

- A. Section 013000 - Administrative Requirements: Coordination and project conditions.
- B. Coordinate this Section with other sections of work, requiring attachment of components to formwork.

## PART 2 PRODUCTS

### 2.1 WOOD FORM MATERIALS

- A. Form Materials: At discretion of Contractor.

### 2.2 FORMWORK ACCESSORIES

- A. Vapor Retarder: Where indicated on Drawings, 10 mil thick polyethylene sheet manufacture by:
  - 1. Stego Wrap Class A: by Stego Industries LLC (887) 464-7834
  - 2. Griffolyn by Reef Industries (800) 231-6074
  - 3. VaporBlock 10 by Raven Industries (800) 635-3456
  - 4. Perminator Vapor – May by W.R. Meadows (800) 342-5976
  - 5. Xtreme by Tex-Trude (281) 452-5961
  - 6. Or Equivalent



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- B. Bituminous Joint Filler: ASTM D1751.
- C. Nails, Spikes, Lag Bolts, Through Bolts, Anchorages: Size, strength and character to maintain formwork in place while placing concrete.
- D. Water Stops: Rubber Polyvinyl chloride, minimum 1,750 psi tensile strength, minimum 50 degrees F to plus 175 degrees F working temperature range, inch wide, maximum possible lengths, ribbed profile, preformed corner sections, heat welded jointing.

\*\*\*\*\* OR \*\*\*\*\*

- E. Waterstop: Flexible strip of bentonite waterproofing compound in coil form for joints in concrete construction.
  - 1. Colloid Environmental Technologies Company Model.
  - 2. TC MiraDRi Model.
  - 3. Paramount Technical Products Model.
  - 4. Substitutions: Section 016000 - Product Requirements Not Permitted.

### PART 3 EXECUTION

#### 3.1 EXAMINATION

- A. Section 013000 - Administrative Requirements: Coordination and project conditions.
- B. Verify lines, levels, and centers before proceeding with formwork. Verify dimensions agree with Drawings.
- C. When formwork is placed after reinforcement resulting in insufficient concrete cover over reinforcement before proceeding, request instructions from Architect/Engineer.

#### 3.2 INSTALLATION

- A. Earth Forms:
  - 1. Earth forms are not permitted.
- B. Formwork - General:
  - 1. Provide top form for sloped surfaces steeper than 1.5 horizontal to 1 vertical to hold shape of concrete during placement, unless it can be demonstrated that top forms can be omitted.
  - 2. Construct forms to correct shape and dimensions, mortar-tight, braced, and of sufficient strength to maintain shape and position under imposed loads from construction operations.
  - 3. Camber forms where necessary to produce level finished soffits unless otherwise shown on Drawings.
  - 4. Carefully verify horizontal and vertical positions of forms. Correct misaligned or misplaced forms before placing concrete.

5. Complete wedging and bracing before placing concrete.
- C. Forms for Smooth Finish Concrete:
1. Use steel, plywood or lined board forms.
  2. Use clean and smooth plywood and form liners, uniform in size, and free from surface and edge damage capable of affecting resulting concrete finish.
  3. Install form lining with close-fitting square joints between separate sheets without springing into place.
  4. Use full size sheets of form lines and plywood wherever possible.
  5. Tape joints to prevent protrusions in concrete.
  6. Use care in forming and stripping wood forms to protect corners and edges.
  7. Level and continue horizontal joints.
  8. Keep wood forms wet until stripped.
- D. Erect formwork, shoring, and bracing to achieve design requirements, in accordance with requirements of ACI 301 ACI 318.
- E. Arrange and assemble formwork to permit dismantling and stripping. Do not damage concrete during stripping. Permit removal of remaining principal shores.
- F. Obtain Architect/Engineer's approval before framing openings in structural members not indicated on Drawings.
- G. Install fillet and chamfer strips on external corners of beams joists columns and.
- H. Install void forms in accordance with manufacturer's recommendations.
1. SureVoid Products, Inc., Englewood, CO (800) 458-5444.
- I. Do not reuse wood formwork more than times for concrete surfaces to be exposed to view. Do not patch formwork.

### 3.3 APPLICATION - FORM RELEASE AGENT

- A. Apply form release agent on formwork in accordance with manufacturer's recommendations.
- B. Apply prior to placement of reinforcing steel, anchoring devices, and embedded items.
- C. Do not apply form release agent where concrete surfaces are indicated to receive special finishes or applied coverings that are affected by agent. Soak inside surfaces of untreated forms with clean water. Keep surfaces coated prior to placement of concrete.
- D. Reuse and Coating of Forms: Thoroughly clean forms and reapply form coating before each reuse. For exposed work, do not reuse forms with damaged faces or edges. Apply form coating to forms in accordance with manufacturer's specifications. Do not coat forms for concrete indicated to receive "scored finish". Apply form coatings before placing reinforcing steel.

### 3.4 INSTALLATION - INSERTS, EMBEDDED PARTS, AND OPENINGS

- A. Install formed openings for items to be embedded in or passing through concrete work.
- B. Locate and set in place items required to be cast directly into concrete.
- C. Coordinate with Work of other sections in forming and placing openings, slots, reglets, recesses, sleeves, bolts, anchors, other inserts, and components of other Work.
- D. Install accessories straight, level, and plumb. Ensure items are not disturbed during concrete placement.
- E. Provide temporary ports or openings in formwork where required to facilitate cleaning and inspection. Locate openings at bottom of forms to allow flushing water to drain.
- F. Close temporary openings with tight fitting panels, flush with inside face of forms, and neatly fitted so joints will not be apparent in exposed concrete surfaces.
- G. Form Ties:
  - 1. Use sufficient strength and sufficient quantity to prevent spreading of forms.
  - 2. Place ties at least 1 inch away from finished surface of concrete.
  - 3. Leave inner rods in concrete when forms are stripped.
  - 4. Space form ties equidistant, symmetrical and aligned vertically and horizontally unless otherwise shown on Drawings.
- H. Arrangement: Arrange formwork to allow proper erection sequence and to permit form removal without damage to concrete.
- I. Construction Joints:
  - 1. Install surfaced pouring strip where construction joints intersect exposed surfaces to provide straight line at joints.
  - 2. Just prior to subsequent concrete placement, remove strip and tighten forms to conceal shrinkage.
  - 3. Show no overlapping of construction joints. Construct joints to present same appearance as butted plywood joints.
  - 4. Arrange joints in continuous line straight, true and sharp.
- J. Openings for Items Passing Through Concrete:
  - 1. Frame openings in concrete where indicated on Drawings. Establish exact locations, sizes, and other conditions required for openings and attachment of work specified under other sections.
  - 2. Coordinate work to avoid cutting and patching of concrete after placement.
  - 3. Perform cutting and repairing of concrete required as result of failure to provide required openings.
- K. Screeds:

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1. Set screeds and establish levels for tops of concrete slabs and levels for finish on slabs.
  2. Slope slabs to drain where required or as shown on Drawings.
  3. Before depositing concrete, remove debris from space to be occupied by concrete and thoroughly wet forms. Remove freestanding water.
- L. Screed Supports:
1. For concrete over waterproof membranes and vapor retarder membranes, use cradle, pad or base type screed supports which will not puncture membrane.
  2. Staking through membrane is not be permitted.
- M. Cleanouts and Access Panels:
1. Provide removable cleanout sections or access panels at bottoms of forms to permit inspection and effective cleaning of loose dirt, debris and waste material.
  2. Clean forms and surfaces against which concrete is to be placed. Remove chips, saw dust and other debris. Thoroughly blow out forms with compressed air just before concrete is placed.

### 3.5 FORM CLEANING

- A. Clean forms as erection proceeds, to remove foreign matter within forms.
- B. Clean formed cavities of debris prior to placing concrete.
- C. Flush with water or use compressed air to remove remaining foreign matter. Ensure that water and debris drain to exterior through clean-out ports.

### 3.6 FORM REMOVAL

- A. Do not remove forms or bracing until concrete has gained sufficient strength to carry its own weight and imposed loads and removal has been approved by Architect/Engineer.
- B. Loosen forms carefully. Do not wedge pry bars, hammers, or tools against finish concrete surfaces scheduled for exposure to view.
- C. Store removed forms in manner that surfaces to be in contact with fresh concrete will not be damaged. Discard damaged forms.
- D. Leave forms in place for minimum number of days as specified in ACI 347.

### 3.7 ERECTION TOLERANCES

- A. Construct formwork to maintain tolerances required by ACI 301 ACI 318.

\*\*\*\*\* OR \*\*\*\*\*

- B. Camber slabs and beams 1/4 inch per 10 feet in accordance with ACI 301 ACI 318.

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3.8 FIELD QUALITY CONTROL

- A. Section 014000 - Quality Requirements 017000 - Execution Requirements: Field inspecting, testing, adjusting, and balancing.
- B. Inspect erected formwork, shoring, and bracing to ensure that work is in accordance with formwork design, and that supports, fastenings, wedges, ties, and items are secure.
- C. Notify Architect/Engineer after placement of reinforcing steel in forms, but prior to placing concrete.
- D. Schedule concrete placement to permit formwork inspection before placing concrete.

END OF SECTION

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SECTION 03 20 00  
CONCRETE REINFORCEMENT

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Reinforcing bars.
  2. Welded wire fabric.
  3. Reinforcement accessories.
- B. Related Sections:
1. Section 031000 - Concrete Forms and Accessories.
  2. Section 033000 - Cast-in-Place Concrete.
  3. Section 033500 - Concrete: Reinforcement for concrete floor toppings.

1.2 REFERENCES

- A. American Concrete Institute:
1. ACI 301 - Specifications for Structural Concrete.
  2. ACI 318 - Building Code Requirements for Structural Concrete.
  3. ACI 530.1 - Specifications for Masonry Structures.
  4. ACI SP-66 - ACI Detailing Manual.
- B. ASTM International:
1. ASTM A82 - Standard Specification for Steel Wire, Plain, for Concrete Reinforcement.
  2. ASTM A184/A184M - Standard Specification for Fabricated Deformed Steel Bar Mats for Concrete Reinforcement.
  3. ASTM A496 - Standard Specification for Steel Wire, Deformed, for Concrete Reinforcement.
  4. ASTM A497 - Standard Specification for Steel Welded Wire Fabric, Deformed, for Concrete Reinforcement.
  5. ASTM A615/A615M - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
  6. ASTM A704/A704M - Standard Specification for Welded Steel Plain Bar or Rod Mats for Concrete Reinforcement.
  7. ASTM A706/A706M - Standard Specification for Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement.
  8. ASTM A767/A767M - Standard Specification for Zinc-Coated (Galvanized) Steel Bars for Concrete Reinforcement.
  9. ASTM A775/A775M - Standard Specification for Epoxy-Coated Reinforcing Steel Bars.

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10. ASTM A884/A884M - Standard Specification for Epoxy-Coated Steel Wire and Welded Wire Fabric for Reinforcement.
11. ASTM A934/A934M - Standard Specification for Epoxy-Coated Prefabricated Steel Reinforcing Bars.
12. ASTM A996/A996M - Standard Specification for Rail-Steel and Axle-Steel Deformed Bars for Concrete Reinforcement.
13. ASTM D3963/D3963M - Standard Specification for Fabrication and Jobsite Handling of Epoxy-Coated Reinforcing Steel Bars.

C. American Welding Society:

1. AWS D1.4 - Structural Welding Code - Reinforcing Steel.

D. Concrete Reinforcing Steel Institute:

1. CRSI - Manual of Standard Practice.
2. CRSI - Placing Reinforcing Bars.

1.3 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Submittal procedures.
- B. Shop Drawings: Indicate bar sizes, spacings, locations, and quantities of reinforcing steel and welded wire fabric, bending and cutting schedules, and supporting and spacing devices.
- C. Certificates: Submit AWS qualification certificate for welders employed on the Work.
- D. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.
  1. Submit certified copies of mill test report of reinforcement materials analysis.

1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with CRSI - Manual of Standard Practice, ACI 301, and ACI 318.
- B. Prepare shop drawings in accordance with ACI SP-66.

1.5 QUALIFICATIONS

- A. Welders: AWS qualified within previous 12 months.

1.6 COORDINATION

- A. Section 013000 - Administrative Requirements: Coordination and project conditions.
- B. Coordinate with placement of formwork, formed openings and other Work.

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## PART 2 PRODUCTS

### 2.1 REINFORCEMENT

- A. Deformed and Plain Reinforcement: ASTM A615/A615M; 60 ksi yield strength, steel bars, unfinished.

### 2.2 ACCESSORY MATERIALS

- A. Tie Wire: Minimum 16 gage annealed.
- B. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for strength and support of reinforcement during concrete placement conditions including load bearing pad on bottom to prevent vapor retarder puncture.
- C. Special Chairs, Bolsters, Bar Supports, Spacers Adjacent to Weather Exposed Concrete Surfaces: Plastic tipped steel; size and shape to meet Project conditions.
- D. Reinforcing Splicing Devices: Mechanical type; full tension and compression; sized to fit joined reinforcing.
- E. Epoxy Coating Patching Material: Type as recommended by coating manufacturer.

### 2.3 FABRICATION

- A. Fabricate concrete reinforcement in accordance with CRSI Manual of Practice, and ACI 318, on and all applicable codes.
- B. Form standard hooks for 180 degree bends, 90 degree bend, stirrup and tie hooks, and seismic hooks as indicated on Drawings.
- C. Form reinforcement bends with minimum diameters in accordance with ACI 318 and all applicable codes.
- D. Fabricate column reinforcement with offset bends at reinforcement splices.
- E. Form spiral column reinforcement from minimum 3/8 inch diameter continuous deformed bar or wire.
- F. Form ties and stirrups from the following:
  - 1. For bars No. 10 and Smaller: No. 3 deformed bars.
  - 2. For bars No. 11 and Larger: No. 4 deformed bars.
- G. Weld reinforcement in accordance with AWS D1.4.
- H. Galvanized Epoxy-Coated Reinforcement: Clean surfaces, weld and re-protect welded joint in accordance with CRSI.



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- I. Locate reinforcement splices not indicated on Drawings, at point of minimum stress. Review location of splices with Architect/Engineer.

2.4 SOURCE QUALITY CONTROL

- A. Section 014000 - Quality Requirements: Testing, inspection and analysis requirements.
- B. Make completed reinforcement available for inspection at manufacturer's factory prior to packaging for shipment. Notify Architect/Engineer at least seven days before inspection is allowed.
- C. When fabricator is approved by authority having jurisdiction, submit certificate of compliance indicating Work performed at fabricator's facility conforms to Contract Documents.
  - 1. Specified shop tests are not required for Work performed by approved fabricator.

PART 3 EXECUTION

3.1 PLACEMENT

- A. Place, support and secure reinforcement against displacement. Do not deviate from required position beyond specified tolerance.
  - 1. Do not weld crossing reinforcement bars for assembly.
- B. Do not displace or damage vapor retarder.
- C. Accommodate placement of formed openings.
- D. Space reinforcement bars with minimum clear spacing in accordance with ACI 318 of one bar diameter, but not less than 1 inch.
  - 1. Where bars are indicated in multiple layers, place upper bars directly above lower bars.
- E. Maintain concrete cover around reinforcement in accordance with ACI 318 applicable code as follows:

Footings and Concrete Formed Against Earth		3 inches
Concrete exposed to earth or weather	No. 6 bars and larger	2 inches
	No. 5 bars and smaller	1-1/2 inches
Supported Slabs, Walls, and Joists	No. 14 bars and larger	1-1/2 inches
	No. 11 bars and smaller	3/4 inches
Beams and Columns		1-1/2 inches

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Shell and Folded Plate Members	No. 6 bars and larger	3/4 inches
	No. 5 bars and smaller	1/2 inches

### 3.2 ERECTION TOLERANCES

- A. Section 014000 - Quality Requirements: Tolerances.
- B. Install reinforcement within the following tolerances for flexural members, walls, and compression members:

Reinforcement Depth	Depth Tolerance	Concrete Cover Tolerance
Greater than 8 inches	plus or minus 3/8 inch	minus 3/8 inch
Less than 8 inches	plus or minus 1/2 inch	minus 1/2 inch

- C. Install reinforcement within the tolerances specified in ACI 530.1 for foundation walls.

### 3.3 FIELD QUALITY CONTROL

- A. Section 014000 - Quality Requirements: Field inspecting, testing, adjusting, and balancing.
- B. Field inspection and testing will be performed by Owner's testing laboratory in accordance with ACI 318 and IBC 2006.
- C. Provide free access to Work and cooperate with appointed firm.
- D. Reinforcement Inspection:
  1. Placement Acceptance: Specified and ACI 318 material requirements and specified placement tolerances.
  2. Welding: Inspect welds in accordance with AWS D1.1.
  3. Periodic Placement Inspection: Inspect for correct materials, fabrication, sizes, locations, spacing, concrete cover, and splicing.
  4. Weldability Inspection: Inspect for reinforcement weldability when formed from steel other than ASTM A706/A706M.
  5. Continuous Weld Inspection: Inspect reinforcement as required by ACI 318.
  6. Periodic Weld Inspection: Other welded connections.

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### 3.4 SCHEDULES

- A. Reinforcement For Superstructure Framing Members: Deformed bars, unfinished.
- B. Reinforcement For Foundation Wall Framing Members and Slab-on-Grade: Deformed bars and wire fabric, galvanized finish.
- C. Reinforcement For Parking Structure Framing Members: Deformed bars, epoxy-coated finish.

END OF SECTION

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## SECTION 03 30 00

### CAST-IN-PLACE CONCRETE

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section includes cast-in-place concrete for the following:
  - 1. Foundation walls.
  - 2. Supported slabs.
  - 3. Slabs on grade.
  - 4. Control, expansion and contraction joint devices.
  - 5. Equipment pads.
  - 6. Light pole base.
  - 7. Flagpole base.
  
- B. Related Sections:
  - 1. Section 031000 - Concrete Forms and Accessories: Formwork and accessories. Placement of joint device joint device anchors in formwork.
  - 2. Section 032000 - Concrete Reinforcement.
  - 3. Section 033500 - Concrete Finishing.
  - 4. Section 033900 - Concrete Curing.

##### 1.2 REFERENCES

- A. American Concrete Institute:
  - 1. ACI 301 - Specifications for Structural Concrete.
  - 2. ACI 305 - Hot Weather Concreting.
  - 3. ACI 306.1 - Standard Specification for Cold Weather Concreting.
  - 4. ACI 308.1 - Standard Specification for Curing Concrete.
  - 5. ACI 318 - Building Code Requirements for Structural Concrete.
  
- B. ASTM International:
  - 1. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
  - 2. ASTM C31/C31M - Standard Practice for Making and Curing Concrete Test Specimens in the Field.
  - 3. ASTM C33 - Standard Specification for Concrete Aggregates.
  - 4. ASTM C39 - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
  - 5. ASTM C42/C42M - Standard Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete.
  - 6. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete.
  - 7. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic Cement Concrete.

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8. ASTM C150 - Standard Specification for Portland Cement.
9. ASTM C172 - Standard Practice for Sampling Freshly Mixed Concrete.
10. ASTM C173/C173M - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method.
11. ASTM C231 - Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
12. ASTM C260 - Standard Specification for Air-Entraining Admixtures for Concrete.
13. ASTM C330 - Standard Specification for Lightweight Aggregates for Structural Concrete.
14. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete.
15. ASTM C595 - Standard Specification for Blended Hydraulic Cements.
16. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete.
17. ASTM C685/C685M - Standard Specification for Concrete Made By Volumetric Batching and Continuous Mixing.
18. ASTM C845 - Standard Specification for Expansive Hydraulic Cement.
19. ASTM C989 - Standard Specification for Ground Granulated Blast-Furnace Slag for Use in Concrete and Mortars.
20. ASTM C1017/C1017M - Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete.
21. ASTM C1064/C1064M - Standard Test Method for Temperature of Freshly Mixed Hydraulic-Cement Concrete.
22. ASTM C1107 - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink).
23. ASTM C1116 - Standard Specification for Fiber-Reinforced Concrete and Shotcrete.
24. ASTM C1157 - Standard Performance Specification for Hydraulic Cement.
25. ASTM C1218 - Standard Test Method for Water-Soluble Chloride in Mortar and Concrete.
26. ASTM C1240 - Standard Specification for Silica Fume Used in Cementitious Mixtures.
27. ASTM D994 - Standard Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type).
28. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
29. ASTM D1752 - Standard Specification for Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction.
30. ASTM D6690 - Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements.
31. ASTM E96 - Standard Test Methods for Water Vapor Transmission of Materials.
32. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.

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33. ASTM E1643 - Standard Practice for Installation of Water Vapor Retarders Used in Contact with Earth or Granular Fill under Concrete Slabs.
34. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs.

### 1.3 PERFORMANCE REQUIREMENTS

- A. Vapor Retarder Permeance: Maximum .03 perm when tested in accordance with ASTM E96.

### 1.4 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Submittal procedures.
- B. Product Data: Submit data on joint devices, attachment accessories, admixtures.
- C. Design Data:
  1. Submit concrete mix design for each concrete strength. Submit separate mix designs when admixtures are required for the following:
    - a. Hot and cold weather concrete work.
    - b. Air entrained concrete work.
  2. Identify mix ingredients and proportions, including admixtures.
  3. Identify chloride content of admixtures and whether or not chloride was added during manufacture.
- D. Manufacturer's Installation Instructions: Submit installation procedures and interface required with adjacent Work.

### 1.5 CLOSEOUT SUBMITTALS

- A. Section 017000 - Execution Requirements: Closeout procedures.
- B. Project Record Documents: Accurately record actual locations of embedded utilities and components concealed from view in finished construction.

### 1.6 QUALITY ASSURANCE

- A. Perform Work in accordance with ACI 301 and ACI 318.
- B. Conform to ACI 305 when concreting during hot weather.
- C. Conform to ACI 306.1 when concreting during cold weather.

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- D. Acquire cement and aggregate from one source for Work.

#### 1.7 COORDINATION

- A. Section 013000 - Administrative Requirements: Coordination and project conditions.
- B. Coordinate placement of joint devices with erection of concrete formwork and placement of form accessories.

#### 1.8 ENVIRONMENTAL REQUIREMENTS

- A. Section 016000 - Product Requirements: Environmental conditions affecting products on site.
- B. Maintain concrete temperature after installation at minimum 50 degrees F for minimum 7 days.

#### 1.9 COORDINATION

- A. Section 013000 - Administrative Requirements: Coordination and project conditions.
- B. Coordinate placement of joint devices with erection of concrete formwork and placement of form accessories.

### PART 2 PRODUCTS

#### 2.1 CONCRETE MATERIALS

- A. Cement: ASTM C150, Type I - Normal
- B. Normal Weight Aggregates: ASTM C33.
  - 1. Coarse Aggregate Maximum Size: 1.5
- C. Water: ACI 318; potable, without deleterious amounts of chloride ions.

#### 2.2 ADMIXTURES

- A. Air Entrainment: ASTM C260.
- B. Fly Ash: ASTM C618 type C or F.
- C. Silica Fume: ASTM C1240.

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2.3 ACCESSORIES

- A. Vapor Retarder: ASTM E1745 Class A; 10 mil thick; type recommended for below grade application. Furnish joint tape recommended by manufacturer.
- B. Non-Shrink Grout: ASTM C1107, premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents; capable of developing minimum compressive strength of 2,400 psi in 48 hours and 7,000 psi in 28 days.

2.4 JOINT DEVICES AND FILLER MATERIALS

- A. Joint Filler; Asphalt impregnated fiberboard or felt, tongue and groove profile.

\*\*\*\*\* OR \*\*\*\*\*

- B. Joint Filler: ASTM D1752; Closed cell, resiliency of 95 percent if not compressed more than 50 percent of original thickness.
- C. Sealant: ASTM C309, Type I approved by Asphalt and Vinyl composition Tile Institute, 30% minimum solids content.

2.5 CONCRETE MIX

- A. Select proportions for normal weight concrete in accordance with ACI 301 Method 1
- B. Provide concrete for the following criteria:

Material and Property	Measurement
Compressive Strength (7 day)	2100 psi
Compressive Strength (28 day)	3000 psi
Cement Type	ASTM C150
Aggregate Size (maximum)	1.5 inch
Air Content	Do not use air entrainment for concrete mixes.
Slump	5 inches

- C. Admixtures: Include admixture types and quantities indicated in concrete mix designs only when approved by Architect/Engineer.
  - 1. Use accelerating admixtures in cold weather. Use of admixtures will not relax cold weather placement requirements.
  - 2. Do not use calcium chloride nor admixtures containing calcium chloride.



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3. Use set retarding admixtures during hot weather.
- D. Site Mixed Concrete: No site mixed concrete is allowed.

### PART 3 EXECUTION

#### 3.1 EXAMINATION

- A. Section 013000 - Administrative Requirements: Coordination and project conditions.
- B. Verify requirements for concrete cover over reinforcement.
- C. Verify anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed, positioned securely, and will not interfere with placing concrete.

#### 3.2 PREPARATION

- A. Prepare previously placed concrete by cleaning with steel brush and applying bonding agent. Remove laitance, coatings, and unsound materials.
- B. In locations where new concrete is doweled to existing work, drill holes in existing concrete, insert steel dowels and pack solid with non-shrink grout.
- C. Remove debris and ice from formwork, reinforcement, and concrete substrates.
- D. Remove water from areas receiving concrete before concrete is placed.

#### 3.3 PLACING CONCRETE

- A. Place concrete in accordance with ACI 301.
- B. Notify testing laboratory and Architect/Engineer minimum 24 hours prior to commencement of operations.
- C. Ensure reinforcement, inserts, embedded parts, formed expansion and contraction joints, and are not disturbed during concrete placement.
- D. Install vapor retarder under interior slabs on grade in accordance with ASTM E1643. Lap joints minimum 6 inches and seal watertight by adhesive applied between overlapping edges and ends as per manufacturer recommendations.
- E. Repair vapor retarder damaged during placement of concrete reinforcing. Repair with vapor retarder material; lap over damaged areas minimum 6 inches and seal watertight.
- F. Install construction joint devices in coordination with floor slab pattern placement sequence. Set top to required elevations. Secure to resist movement by wet concrete.

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- G. Install joint device anchors. Maintain correct position to allow joint cover to be flush with floor finish.
- H. Install joint covers in one piece longest practical length, when adjacent construction activity is complete.
- I. Deposit concrete at final position. Prevent segregation of mix.
- J. Place concrete in continuous operation for each panel or section determined by predetermined joints.
- K. Consolidate concrete.
- L. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.
- M. Place concrete continuously between predetermined expansion, control, and construction joints.
- N. Do not interrupt successive placement; do not permit cold joints to occur.
- O. Saw cut joints within 12 hours after placing. Use 3/16 inch thick blade, cut into 1/4 depth of slab thickness.
- P. Screed floors and slabs on grade level, maintaining surface flatness of  $F_f$  of 35.

3.4 CONCRETE FINISHING

- A. Finish concrete floor surfaces to requirements of Section 03350.
- B. In areas with floor drains, maintain floor elevation at walls; pitch surfaces uniformly to drains.

3.5 CURING AND PROTECTION

- A. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.
  - 1. Protect concrete footings from freezing for minimum 5 days.
- B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.
- C. Cure floor surfaces as specified in Section 03390.
- D. Ponding: Maintain 100 percent coverage of water over floor slab areas continuously for 7 days.

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- E. Spraying: Spray water over floor slab areas and maintain wet for 7 days.

### 3.6 FIELD QUALITY CONTROL

- A. Section 014000 - Quality Requirements: Field inspecting, testing, adjusting, and balancing.
- B. Field inspection and testing will be performed by Owner's testing laboratory in accordance with ACI 318
- C. Provide free access to Work and cooperate with appointed firm.
- D. Submit proposed mix design of each class of concrete to inspection and testing firm for review prior to commencement of Work.
- E. Concrete Inspections:
  - 1. Continuous Placement Inspection: Inspect for proper installation procedures.
  - 2. Periodic Curing Inspection: Inspect for specified curing temperature and procedures.
- F. Strength Test Samples:
  - 1. Sampling Procedures: ASTM C172.
  - 2. Cylinder Molding and Curing Procedures: ASTM C31/C31M, cylinder specimens, standard cured field cured.
  - 3. Sample concrete and make one set of three cylinders for every 150 cu yds or less of each class of concrete placed each day and for every 5,000 sf of surface area for slabs and walls.
  - 4. When volume of concrete for any class of concrete would provide less than 3 sets of cylinders, take samples from three randomly selected batches, or from every batch when less than 3 batches are used.
  - 5. Make one additional cylinder during cold weather concreting, and field cure.
- G. Field Testing:
  - 1. Slump Test Method: ASTM C143/C143M.
  - 2. Air Content Test Method: ASTM C173/C173M.
  - 3. Temperature Test Method: ASTM C1064/C1064M.
  - 4. Measure slump and temperature for each compressive strength concrete sample.
  - 5. Measure air content in air entrained concrete for each compressive strength concrete sample.
- H. Cylinder Compressive Strength Testing:
  - 1. Test Method: ASTM C39.
  - 2. Test Acceptance: In accordance with ACI 318 .
  - 3. Test one cylinder at 7 days.
  - 4. Test two cylinders at 28 days.
  - 5. Dispose remaining cylinders when testing is not required.

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- I. Core Compressive Strength Testing:
  - 1. Sampling and Testing Procedures: ASTM C42/C42M.
  - 2. Test Acceptance: In accordance with ACI 318.
  - 3. Drill three cores for each failed strength test from concrete represented by failed strength test.
- J. Water Soluble Chloride Ion Concentration Test Method: ASTM C1218; tested at 28 days.
  - 1. Maximum Concentration: As permitted by applicable code.
- K. Maintain records of concrete placement. Record date, location, quantity, air temperature and test samples taken.

### 3.7 PATCHING

- A. Allow Architect/Engineer to inspect concrete surfaces immediately upon removal of forms.
- B. Excessive honeycomb or embedded debris in concrete is not acceptable. Notify Architect/Engineer upon discovery.
- C. Patch imperfections as directed by Architect/Engineer

### 3.8 DEFECTIVE CONCRETE

- A. Defective Concrete: Concrete not conforming to required lines, details, dimensions, tolerances or specified requirements.
- B. Repair or replacement of defective concrete will be determined by Architect/Engineer.
- C. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Architect/Engineer for each individual area.

### 3.9 SCHEDULE - CONCRETE TYPES AND FINISHES

- A. Foundation Walls: 3,000 psi 28 day concrete, form finish with honeycomb filled surface.
- B. Underside of Supported Floors and Structure Exposed to View: 4,000 psi 28 day concrete, sack rubbed finish.
- C. Exposed Portico Structure: 4,000 psi 28 day concrete, air entrained, smooth stone rubbed finish.

### 3.10 SCHEDULE - JOINT FILLERS

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- A. Basement Floor Slab Perimeter: Joint filler Type A set 1/8 inch below floor slab elevation.
- B. Exterior Retaining Wall at Loading Dock: Joint filler Type F recessed 3/8 inch with sealant cover.

END OF SECTION

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SECTION 03 35 00  
CONCRETE FINISHING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
  - 1. Finishing concrete floors [and floor toppings].
  - 2. Floor surface treatment.
  
- B. Related Sections:
  - 1. Section 033000 - Cast-in-Place Concrete: [Prepared concrete floors ready to receive finish;] [control and formed expansion and contraction joints and joint devices].
  - 2. Section 03360 - Concrete Finishes: Exposed aggregate finish.
  - 3. Section 033900 - Concrete Curing.
  - 4. Section 079513 - Expansion Joint Cover Assemblies.
  - 5. Section 079200 - Joint Sealers.

1.2 REFERENCES

- A. American Concrete Institute:
  - 1. ACI 301 - Specifications for Structural Concrete.
  - 2. ACI 302.1 - Guide for Concrete Floor and Slab Construction.
  
- B. ASTM International:
  - 1. ASTM E1155 - Standard Test Method for Determining Floor Flatness and of Levelness Using the F-number System.

1.3 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Submittal procedures.
  
- B. Product Data: Submit data on concrete hardener, sealer, curing compounds curing papers and slip resistant treatment, compatibilities, and limitations.

1.4 CLOSEOUT SUBMITTALS

- A. Section 017000 - Execution Requirements: Closeout procedures.
  
- B. Operation and Maintenance Data: Submit data on maintenance renewal of applied coatings.

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1.5 QUALITY ASSURANCE

- A. Perform Work in accordance with ACI 301 and ACI 302.1.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Section 016000 - Product Requirements: Product storage and handling requirements.
- B. Deliver materials in manufacturer's packaging including application instructions.

1.7 ENVIRONMENTAL REQUIREMENTS

- A. Section 016000 - Product Requirements: Environmental conditions affecting products on site.

1.8 COMPOUNDS - HARDENERS AND SEALERS

- A. Chemical Hardener: Magnesium fluorosilicate and zinc fluorosilicate blend

PART 2 EXECUTION

2.1 EXAMINATION

- A. Section 013000 - Administrative Requirements: Coordination and project conditions.
- B. Verify floor surfaces are acceptable to receive the Work of this section.

2.2 FLOOR FINISHING

- A. Finish concrete floor surfaces in accordance with ACI 301 and ACI 302.1.
- B. Wood float surfaces receiving quarry tile, ceramic tile, and cementitious terrazzo with full bed setting system.
- C. Steel trowel surfaces receiving carpeting, resilient flooring, seamless flooring, thin set terrazzo, thin set quarry tile, and thin set ceramic tile.
- D. Steel trowel surfaces which are scheduled to be exposed.

2.3 TOLERANCES

- A. Section 014000 - Quality Requirements: Tolerances.
- B. Measure for F(F) and F(L) tolerances for floors in accordance with ASTM E1155, within 48 hours after slab installation.
- C. Finish concrete to achieve the following tolerances:

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1. Under Glazed Tile on Setting Bed: F(F) 35 and F(L) 20.
  2. Under Resilient Finishes: F(F) 75 and F(L) 50.
  3. Exposed to View and Foot Traffic: F(F) 75 and F(L) 40.
  4. Correct slab surface when actual F(F) or F(L) number for floor installation measures less than required.
- D. Correct defects in defined traffic floor by grinding or removal and replacement of defective Work. Areas requiring corrective Work will be identified. Re-measure corrected areas by same process.

END OF SECTION



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SECTION 03 39 00

CONCRETE CURING

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes initial and final curing of horizontal and vertical concrete surfaces.
- B. Related Sections:
  - 1. Section 033000 - Cast-In-Place Concrete.
  - 2. Section 033500 - Concrete Finishing.

1.2 REFERENCES

- A. American Concrete Institute:
  - 1. ACI 301 - Specifications for Structural Concrete.
  - 2. ACI 302.1 - Guide for Concrete Floor and Slab Construction.
  - 3. ACI 308.1 - Standard Specification for Curing Concrete.
  - 4. ACI 318 - Building Code Requirements for Structural Concrete.
- B. ASTM International:
  - 1. ASTM C171 - Standard Specification for Sheet Materials for Curing Concrete.
  - 2. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
  - 3. ASTM C1315 - Standard Specification for Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete.
  - 4. ASTM D2103 - Standard Specification for Polyethylene Film and Sheeting.

1.3 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Submittal procedures.
- B. Product Data: Submit data on curing compounds, mats, paper, film, compatibilities, and limitations.

1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with ACI 301.

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## PART 2 PRODUCTS

### 2.1 MATERIALS

- A. Membrane Curing Compound Type 1.
- B. Membrane Curing Compound: ASTM C1315 Type I.
- C. Water: Potable, not detrimental to concrete.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Section 013000 - Administrative Requirements: Coordination and project conditions.
- B. Verify substrate surfaces are ready to be cured.

### 3.2 INSTALLATION - HORIZONTAL SURFACES

- A. Cure concrete in accordance with ACI 308.1.
- B. Ponding: Maintain 100 percent coverage of water over floor slab areas, continuously for 4 days.

\*\*\*\*\* [OR] \*\*\*\*\*

- C. Spraying: Spray water over floor slab areas and maintain wet for 7 days.

\*\*\*\*\* [OR] \*\*\*\*\*

- D. Absorptive Mat: Spread cotton fabric over floor slab areas. Spray with water until mats are saturated, and maintain in saturated condition for 7 days.

\*\*\*\*\* [OR] \*\*\*\*\*

- E. Absorptive Mat: Saturate burlap-polyethylene and place burlap-side down over floor slab areas, lapping ends and sides; maintain in place for 7 days.

### 3.3 PROTECTION OF FINISHED WORK

- A. Section 017000 - Execution Requirements: Protecting finished Work.
- B. Do not permit traffic over unprotected floor surface.

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#### 3.4 SCHEDULES

- A. Storage Area Slabs: Absorptive mats, burlap-polyethylene type.
- B. Retaining Walls: Membrane curing compound, acrylic type, clear color.
- C. Concrete Pavement: Membrane curing compound, opaque color.
- D. Other Floor Areas: Membrane curing compound, acrylic type, translucent color.

END OF SECTION

SECTION 03 60 00

GROUT

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
  - 1. Portland cement grout.
  - 2. Rapid curing epoxy grout.
  - 3. Non-shrink cementitious grout.
  
- B. Related Sections:
  - 1. Section 033000 - Cast-in-Place Concrete.

1.2 REFERENCES

- A. American Concrete Institute:
  - 1. ACI 301 - Specifications for Structural Concrete.
  - 2. ACI 318 - Building Code Requirements for Structural Concrete.
  
- B. American Society of Testing and Materials:
  - 1. ASTM C33 - Standard Specification for Concrete Aggregates.
  - 2. ASTM C40 - Test Method for Organic Impurities in Fine Aggregates for Concrete.
  - 3. ASTM C150 - Standard Specification for Portland Cement.
  - 4. ASTM C191 - Test Method for Time of Setting of Hydraulic Cement by Vicat Needle.
  - 5. ASTM C307 - Test Method for Tensile Strength of Chemical-Resistant Mortar, Grouts, and Monolithic Surfacing.
  - 6. ASTM C531 - Test Method for Linear Shrinkage and Coefficient of Thermal Expansion of Chemical-Resistant Mortars, Grouts, Monolithic Surfacing, and Polymer Concretes.
  - 7. ASTM C579 - Test Method for Compressive Strength of Chemical-Resistant Mortars, Grouts, monolithic Surfacing and Polymer Concretes.
  - 8. ASTM C827 - Test Method for Change in Height at Early Ages of Cylindrical Specimens from Cementitious Mixtures.
  
- C. U. S. Army Corps of Engineers Concrete Research Division (CRD):
  - 1. CRD C621 - Non-Shrink Grout.

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PART 2 PRODUCTS

2.1 PORTLAND CEMENT GROUT MATERIALS

- A. Portland Cement: ASTM C150, Type I and II.
- B. Water:
  - 1. Potable; containing no impurities, suspended particles, algae or dissolved natural salts in quantities capable of causing:
    - a. Corrosion of steel.
    - b. Volume change increasing shrinkage cracking.
    - c. Efflorescence.
    - d. Excess air entraining.
- C. Fine Aggregate:
  - 1. Washed natural sand.
  - 2. Gradation in accordance with ASTM C33 and represented by smooth granulometric curve within required limits.
  - 3. Free from injurious amounts of organic impurities as determined by ASTM C40.
- D. Mix:
  - 1. Portland cement, sand and water. Do not use ferrous aggregate or staining ingredients in grout mixes.

2.2 RAPID CURING EPOXY GROUT

- A. Rapid Curing Epoxy Grout: High strength, three component epoxy grout formulated with thermosetting resins and inert fillers. Rapid-curing, high adhesion, and resistant to ordinary chemicals, acids and alkalis.

Compressive Strength	ASTM C579	12,000 psi at 7 days
Tensile Strength	ASTM C307	2,000 psi minimum
Coefficient of Expansion	ASTM C531	30x10 <sup>-6</sup> in per degree F
Shrinkage	ASTM C827	None

2.3 NON-SHRINK CEMENTITIOUS GROUT

- A. Properties: Certified to maintain initial placement volume or expand after set and meet the following minimum properties when tested in accordance with CRD-C621, for Type D non-shrink grout:

Property	Test	Time	Result
Setting Time	ASTM C191	Initial	2 hours (Approx)
		Final	3 hours (Approx)
Expansion			0.10% - 0.4% Maximum

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Compressive Strength	CRD-C621	1 day	4,000 psi
		7 days	7,000 psi
		28 days	10,000 psi to 10,800 psi

## 2.4 FORMWORK

- A. Refer to Section 031000 for formwork requirements.

## 2.5 CURING

- A. Prevent rapid loss of water from grout during first 48 hours by use of approved membrane curing compound or with use of wet burlap method.

## PART 3 EXECUTION

### 3.1 PREPARATION

- A. Remove defective concrete, laitance, dirt, oil, grease and other foreign material from concrete surfaces by brushing, hammering, chipping or other similar means until sound, clean concrete surface is achieved.
- B. Rough concrete lightly, but not enough to interfere with placement of grout.
- C. Remove foreign materials from metal surfaces in contact with grout.
- D. Align, level and maintain final positioning of components to be grouted.
- E. Saturate concrete surfaces with clean water; remove excess water, leave none standing.

### 3.2 MIXING

- A. Portland Cement Grout:
  1. Use proportions of 2 parts sand and 1 part cement, measured by volume.
  2. Prepare grout with water to obtain consistency to permit placing and packing.
  3. Mix water and grout in two steps; pre-mix using approximately 2/3 of water; after partial mixing, add remaining water to bring mix to desired placement consistency and continue mixing 2 to 3 minutes.
  4. Mix only quantities of grout capable of being placed within 30 minutes after mixing.
  5. Do not add additional water after grout has been mixed.
  6. Capable of developing minimum compressive strength of 2400 psi in 48 hours and 7000 psi in 28 days.

\*\*\*\*\* [OR] \*\*\*\*\*

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### 3.3 PLACING GROUT

- A. Place grout material quickly and continuously.
- B. Do not use pneumatic-pressure or dry-packing methods.
- C. Apply grout from one side only to avoid entrapping air.
- D. Do not vibrate placed grout mixture, or permit placement when area is being vibrated by nearby equipment.
- E. Thoroughly compact final installation and eliminate air pockets.
- F. Do not remove leveling shims for at least 48 hours after grout has been placed.

### 3.4 CURING

- A. Immediately after placement, protect grout from premature drying, excessively hot or cold temperatures, and mechanical injury.
- B. After grout has attained its initial set, keep damp for minimum of 3 days.

### 3.5 FIELD QUALITY CONTROL

- A. Submit proposed mix design of each class of grout to inspection and testing firm for review prior to commencement of Work.
- B. Tests of grout components may be performed to ensure conformance with specified requirements.

END OF SECTION

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## SECTION 04 05 14

### MASONRY MORTAR AND GROUT

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section includes mortar and grout for masonry.
- B. Related Sections:
  - 1. Section 042000 - Unit Masonry Assemblies: Installation of mortar and grout.
  - 2. Section 042016 - Reinforced Unit Masonry Assemblies: Installation of mortar and grout.

##### 1.2 REFERENCES

- A. American Concrete Institute:
  - 1. ACI 530 - Building Code Requirements for Masonry Structures.
  - 2. ACI 530.1 - Specifications for Masonry Structures.
- B. ASTM International:
  - 1. ASTM C5 - Standard Specification for Quicklime for Structural Purposes.
  - 2. ASTM C91 - Standard Specification for Masonry Cement.
  - 3. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete.
  - 4. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic Cement Concrete.
  - 5. ASTM C144 - Standard Specification for Aggregate for Masonry Mortar.
  - 6. ASTM C150 - Standard Specification for Portland Cement.
  - 7. ASTM C199 - Standard Test Method for Pier Test for Refractory Mortars.
  - 8. ASTM C206 - Standard Specification for Finishing Hydrated Lime.
  - 9. ASTM C270 - Standard Specification for Mortar for Unit Masonry.
  - 10. ASTM C387 - Standard Specification for Packaged, Dry, Combined Materials for Mortar and Concrete.
  - 11. ASTM C404 - Standard Specification for Aggregates for Masonry Grout.
  - 12. ASTM C476 - Standard Specification for Grout for Masonry.
  - 13. ASTM C595 - Standard Specification for Blended Hydraulic Cements.
  - 14. ASTM C780 - Standard Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry.
  - 15. ASTM C1019 - Standard Test Method for Sampling and Testing Grout.
  - 16. ASTM C1142 - Standard Specification for Extended Life Mortar for Unit Masonry.
  - 17. ASTM C1314 - Standard Test Method for Constructing and Testing Masonry Prisms Used to Determine Compliance with Specified Compressive Strength of Masonry.
  - 18. ASTM C1329 - Standard Specification for Mortar Cement.



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19. ASTM C1357 - Standard Test Method for Evaluating Masonry Bond Strength.

### 1.3 SUBMITTALS

- A. Section 01330 - Submittal Procedures: Submittal requirements.
- B. Design Data: Submit design mix when Property specification of ASTM C270 is to be used, required environmental conditions, and admixture limitations.

### 1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with ACI 530 and ACI 530.1.

### 1.5 ENVIRONMENTAL REQUIREMENTS

- A. Section 016000 - Product Requirements.
- B. Cold Weather Requirements: In accordance with ACI 530.1 when ambient temperature or temperature of masonry units is less than 40 degrees F.
- C. Hot Weather Requirements: In accordance with ACI 530.1 when ambient temperature is greater than 100 degrees F or ambient temperature is greater than 90 degrees F with wind velocity greater than 8 mph.

## PART 2 PRODUCTS

### 2.1 COMPONENTS

- A. Portland Cement: ASTM C150, Type I
- B. Calcium chloride is not permitted.

### 2.2 MIXES

- A. Mortar Mixes:
  - 1. Extended Life Mortar: ASTM C1142, Type RS
- B. Mortar Mixing:
  - 1. Thoroughly mix mortar ingredients in accordance with ASTM C270 in quantities needed for immediate use.
  - 2. Achieve uniformly damp sand immediately before mixing process.
  - 3. Re-temper only within two hours of mixing.
- C. Grout Mixes:

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1. Grout for Non-Structural Masonry: 3,000 psi strength at 28 days; 8-11 inches slump; mixed in accordance with ASTM C476 grout.
  2. Grout for Structural Masonry: 3,000 psi strength at 28 days; 8-11 inches slump; mixed in accordance with ASTM C476 grout.
  3. Application:
    - a. Coarse Grout: For grouting spaces with minimum 4 inches dimension in every direction.
    - b. Fine Grout: For grouting other spaces.
- D. Grout Mixing:
1. Mix grout in accordance with ASTM C94/C94M, modified to use ingredients complying with ASTM C476.
  2. Add admixtures; mix uniformly.

### PART 3 EXECUTION

#### 3.1 EXAMINATION

- A. Section 013000 - Administrative Requirements: Coordination and project conditions.
- B. Request inspection of spaces to be grouted.

#### 3.2 INSTALLATION

- A. Install mortar and grout in accordance with ACI 530.1 Specifications for Masonry Structures.

#### 3.3 FIELD QUALITY CONTROL

- A. Establishing Mortar Mix: In accordance with ASTM C270.
- B. Testing Frequency: One set of specified tests for every 5,000 sf of completed wall area.
- C. Testing of Mortar Mix: In accordance with ASTM C780 for aggregate ratio and water content, air content, consistency, and compressive strength.
- D. Testing of Grout Mix: In accordance with ASTM C1019 for compressive strength, and in accordance with ASTM C143/C143M for slump.
- E. Test compressive strength of mortar and masonry to ASTM C1314; test in accordance with masonry unit sections specified.

END OF SECTION

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## SECTION 04 20 16

### REINFORCED UNIT MASONRY ASSEMBLIES

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section includes concrete masonry units, reinforcement, anchorage, and accessories.
- B. Related Sections:
  - 1. Section 040514 - Masonry Mortar and Grout: Mortar and grout.

##### 1.2 REFERENCES

- A. American Concrete Institute:
  - 1. ACI 530 - Building Code Requirements for Masonry Structures.
  - 2. ACI 530.1 - Specifications for Masonry Structures.
- B. ASTM International:
  - 1. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
  - 2. ASTM A240/A240M - Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
  - 3. ASTM A307 - Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength.
  - 4. ASTM A580/A580M - Standard Specification for Stainless Steel Wire.
  - 5. ASTM A615/A615M - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
  - 6. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
  - 7. ASTM A951 - Standard Specification for Masonry Joint Reinforcement.
  - 8. ASTM B370 - Standard Specification for Copper Sheet and Strip for Building Construction.
  - 9. ASTM B695 - Standard Specification for Coatings of Zinc Mechanically Deposited on Iron and Steel.
  - 10. ASTM C27 - Standard Classification of Fireclay and High-Alumina Refractory Brick.
  - 11. ASTM C34 - Standard Specification for Structural Clay Load-Bearing Wall Tile.
  - 12. ASTM C55 - Standard Specification for Concrete Brick.
  - 13. ASTM C56 - Standard Specification for Structural Clay Non-Load-Bearing Tile.
  - 14. ASTM C62 - Standard Specification for Building Brick (Solid Masonry Units Made From Clay or Shale).
  - 15. ASTM C67 - Standard Test Methods for Sampling and Testing Brick and Structural Clay Tile.

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16. ASTM C73 - Standard Specification for Calcium Silicate Face Brick (Sand-Lime Brick).
17. ASTM C90 - Standard Specification for Loadbearing Concrete Masonry Units.
18. ASTM C126 - Standard Specification for Ceramic Glazed Structural Clay Facing Tile, Facing Brick, and Solid Masonry Units.
19. ASTM C129 - Standard Specification for Nonloadbearing Concrete Masonry Units.
20. ASTM C140 - Standard Test Methods of Sampling and Testing Concrete Masonry Units.
21. ASTM C212 - Standard Specification for Structural Clay Facing Tile.
22. ASTM C216 - Standard Specification for Facing Brick (Solid Masonry Units Made from Clay or Shale).
23. ASTM C315 - Standard Specification for Clay Flue Linings.
24. ASTM C530 - Standard Specification for Structural Clay Non-Loadbearing Screen Tile.
25. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation.
26. ASTM C652 - Standard Specification for Hollow Brick (Hollow Masonry Units Made From Clay or Shale).
27. ASTM C744 - Standard Specification for Prefaced Concrete and Calcium Silicate Masonry Units.
28. ASTM C1261 - Standard Specification for Firebox Brick for Residential Fireplaces.
29. ASTM C1283 - Standard Practice for Installing Clay Flue Lining.
30. ASTM D226 - Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing.
31. ASTM E84 - Test Method for Surface Burning Characteristics of Building Materials.
32. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.

C. National Fire Protection Association:

1. NFPA 255 - Standard Method of Test of Surface Burning Characteristics of Building Materials.

D. Underwriters Laboratories Inc.:

1. UL 723 - Tests for Surface Burning Characteristics of Building Materials.

1.3 PERFORMANCE REQUIREMENTS

A. Concrete Masonry Compressive Strength

1. Concrete Masonry Units: 1900 psi minimum net area compressive strength.

1.4 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Submittal requirements.

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B. Shop Drawings: Indicate bars sizes, spacings, locations, reinforcement quantities, bending and cutting schedules, supporting and spacing devices for reinforcement.

C. Product Data:

1. Submit data for masonry units and fabricated wire reinforcement.

#### 1.5 QUALITY ASSURANCE

A. Perform Work in accordance with ACI 530 and ACI 530.1.

#### 1.6 QUALIFICATIONS

A. Installer: Company specializing in performing Work of this section with minimum three years experience.

#### 1.7 ENVIRONMENTAL REQUIREMENTS

A. Section 016000 - Product Requirements.

B. Cold Weather Requirements: In accordance with ACI 530.1 when ambient temperature or temperature of masonry units is less than 40 degrees F.

C. Hot Weather Requirements: In accordance with ACI 530.1 when ambient temperature is greater than 100 degrees F or ambient temperature is greater than 90 degrees F with wind velocity greater than 8 mph.

### PART 2 PRODUCTS

#### 2.1 COMPONENTS

A. Hollow Load Bearing Concrete Masonry Units (CMU): ASTM C90; normal weight.

#### 2.2 ACCESSORIES

A. Single Wythe Joint Reinforcement: ASTM A951; ladder type; 0.148 inch diameter side rods with 0.148 inch diameter cross ties.

B. Reinforcing Steel: ASTM A615/A615M, 60 ksi yield grade, deformed billet bars.

C. Anchor Rods: ASTM A307; Grade C; J-shaped or L-shaped; complete with washers and heavy hex nuts; sized for minimum 15 inch embedment.

1. Hot-Dipped Galvanizing: ASTM A153/A153M.
2. Mechanical Galvanizing: ASTM B695; Class 55.

D. Mortar and Grout: As specified in Section 04065.

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- E. Joint Filler: Closed cell rubber; oversized 50 percent to joint width; self expanding.

### 2.3 SOURCE QUALITY CONTROL

- A. Section 014000 - Quality Requirements: Testing, inspection and analysis requirements.
- B. Test brick efflorescence in accordance with ASTM C67. Brick rated greater than “slightly effloresced” is not acceptable.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Section 013000 - Administrative Requirements: Coordination and project conditions.
- B. Verify field conditions are acceptable and are ready to receive work.
- C. Verify items provided by other sections of work are properly sized and located.
- D. Verify built-in items are in proper location, and ready for roughing into masonry work.

### 3.2 PREPARATION

- A. Direct and coordinate placement of metal anchors supplied to other Sections.
- B. Furnish temporary bracing during installation of masonry work. Maintain in place until building structure provides permanent support.
- C. Wet clay and shale brick before laying when initial rate of absorption is greater than 30 grams when tested in accordance with ASTM C67.

### 3.3 INSTALLATION

- A. Establish lines, levels, and coursing indicated. Protect from displacement.
- B. Maintain masonry courses to uniform dimension. Form bed and head joints of uniform thickness.
- C. Coursing of Concrete Masonry Units:
  - 1. Bond: Running.
  - 2. Coursing: One unit and one mortar joint to equal 8 inches.
  - 3. Mortar Joints: Concave.
- D. Placing And Bonding:
  - 1. Lay solid masonry units in full bed of mortar, with full head joints.
  - 2. Lay hollow masonry units with face shell bedding on head and bed joints.

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3. Buttering corners of joints or excessive furrowing of mortar joints are not permitted.
4. Remove excess mortar as Work progresses.
5. Interlock intersections and external corners.
6. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment is required, remove mortar and replace.
7. Perform job site cutting of masonry units with proper tools to assure straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.
8. Isolate masonry from vertical structural framing members with movement joint .
9. Isolate top of masonry from horizontal structural framing members and slabs or decks.

E. Joint Reinforcement And Anchorage:

1. Install horizontal joint reinforcement 16 inches oc.
2. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches each side of opening.
3. Place joint reinforcement continuous in first and second joint below top of walls.
4. Lap joint reinforcement ends minimum 6 inches.
5. Support and secure reinforcing bars from displacement. Maintain position within 1/2 inch of dimensioned position.
6. Embed anchors embedded in concrete attached to structural steel members. Embed anchorages in every sixth brick.

F. Lintels:

1. Install precast concrete lintels over openings.
2. Install reinforced unit masonry lintels over openings where steel or precast concrete lintels are not scheduled or indicated.
3. Openings Up To 42 inches Wide: Reinforce openings as indicated on Drawings.
4. Openings From 42 inches Up To 78 inches Wide: Reinforce openings as indicated on Drawings.
5. Openings Over 78 inches: Reinforce openings as indicated on Drawings.
6. Do not splice reinforcing bars.
7. Support and secure reinforcing bars from displacement.
8. Place and consolidate grout fill without displacing reinforcing.
9. Allow masonry lintels to attain specified strength before removing temporary supports.
10. Maintain minimum 8 inches bearing on each side of opening.

G. Grouted Components:

1. Reinforce bond beam with 1, No. 5 bar.
2. Reinforce pilaster with 1, No. 6 bar in each cell.
3. Lap splices bar diameters required by code.
4. Support and secure reinforcing bars from displacement.
5. Place and consolidate grout fill without displacing reinforcing.
6. At bearing locations, fill masonry cores with grout for minimum 12 inches either side of opening.

- H. Reinforced Masonry:
  - 1. Lay masonry units with cells vertically aligned and cavities between wythes clear of mortar and unobstructed.
  - 2. Place reinforcing, reinforcement bars, and grout as indicated on Drawings.
  - 3. Splice reinforcement in accordance with Section 03200.
  - 4. Support and secure reinforcement from displacement.
  - 5. Place and consolidate grout fill without displacing reinforcing.
  - 6. Place grout in accordance with ACI 530.1 Specification for Masonry Structures.
  
- I. Control And Expansion Joints:
  - 1. Install control and expansion joints at the following maximum spacings, unless otherwise indicated on Drawings:
    - a. Exterior Walls: 20 feet on center and within 10 feet on one side of each interior and exterior corner.
    - b. Interior Walls: 30 feet on center.
    - c. At changes in wall height.
  - 2. Do not continue horizontal joint reinforcement through control and expansion joints.
  - 3. Install preformed control joint device in continuous lengths. Seal butt and corner joints.
  - 4. Size control joint in accordance with Section 07900 for sealant performance.
  - 5. Form expansion joint by omitting mortar and cutting unit to form open space.
  
- J. Cutting And Fitting:
  - 1. Obtain Architect/Engineer's approval prior to cutting or fitting masonry work not indicated or where appearance or strength of masonry work may be impaired.

#### 3.4 ERECTION TOLERANCES

- A. Section 014000 - Quality Requirements: Tolerances.
- B. Maximum Variation From Alignment of Pilasters: 1/4 inch.
- C. Maximum Variation From Unit to Adjacent Unit: 1/16 inch.
- D. Maximum Variation from Plane of Wall: 1/4 inch in 10 ft and 1/2 inch in 20 ft or more.
- E. Maximum Variation from Plumb: 1/4 inch per story non-cumulative; 1/2 inch in two stories or more.
- F. Maximum Variation from Level Coursing: 1/8 inch in 3 ft and 1/4 inch in 10 ft; 1/2 inch in 30 ft.
- G. Maximum Variation of Joint Thickness: 1/8 inch in 3 ft.
- H. Maximum Variation from Cross Sectional Thickness of Walls: 1/4 inch.



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- I. Maximum Variation for Steel Reinforcement:
  - 1. Install reinforcement within the tolerances specified in ACI 530.1 for foundation walls.
  - 2. Plus or minus 1/2 inch when distance from centerline of steel to opposite face of masonry is 8 inches or less.
  - 3. Plus or minus 1 inch when distance is between 8 and 24 inches.
  - 4. Plus or minus 1-1/4 inch when distance is greater than 24 inches.
  - 5. Plus or minus 2 inches from location along face of wall.

3.5 FIELD QUALITY CONTROL

- A. Concrete Masonry Units: Test each type in accordance with ASTM C140.

3.6 CLEANING

- A. Section 017000 - Execution Requirements: Final cleaning.
- B. Remove excess mortar and mortar smears as work progresses.
- C. Replace defective mortar. Match adjacent work.
- D. Clean soiled surfaces with cleaning solution.
- E. Use non-metallic tools in cleaning operations.

3.7 PROTECTION OF FINISHED WORK

- A. Section 017000 - Execution Requirements: Requirements for protecting finished Work.
- B. Protect exposed external corners subject to damage.
- C. Protect base of walls from mud and mortar splatter.
- D. Protect masonry and other items built into masonry walls from mortar droppings and staining caused by mortar.
- E. Protect tops of masonry work with waterproof coverings secured in place without damaging masonry. Provide coverings where masonry is exposed to weather when work is not in progress.

END OF SECTION

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SECTION 06 10 00

ROUGH CARPENTRY

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes structural floor, wall, and roof framing; built-up structural beams and columns; diaphragm trusses fabricated on site; floor, wall, and roof sheathing; preservative treatment of wood; fire retardant treatment of wood; miscellaneous framing and sheathing.

1.2 REFERENCES

- A. American National Standards Institute:
  - 1. ANSI A135.4 - Basic Hardboard.
  - 2. ANSI A208.1 - Mat-Formed Wood Particleboard.
- B. American Wood-Preservers' Association:
  - 1. AWPA C1 - All Timber Products - Preservative Treatment by Pressure Process.
  - 2. AWPA C20 - Structural Lumber - Fire-Retardant Treatment by Pressure Processes.
- C. ASTM International:
  - 1. ASTM C1177/C1177M - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing.
  - 2. ASTM C1280 - Standard Specification for Application of Gypsum Sheathing.
  - 3. ASTM C1396/C1396M - Standard Specification for Gypsum Board.
  - 4. ASTM D5456 - Standard Specification for Evaluation of Structural Composite Lumber Products.
  - 5. ASTM E84 - Test Method for Surface Burning Characteristics of Building Materials.
  - 6. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
  - 7. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.
  - 8. ASTM F1667 - Standard Specification for Driven Fasteners: Nails, Spikes, and Staples.
- D. National Fire Protection Association:
  - 1. NFPA 255 - Standard Method of Test of Surface Burning Characteristics of Building Materials.
- E. U. S Department of Commerce National Institute of Standards and Technology:

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1. DOC PS 1 - Construction and Industrial Plywood.
  2. DOC PS 2 - Performance Standard for Wood-Based Structural-Use Panels.
  3. DOC PS 20 - American Softwood Lumber Standard.
- F. National Lumber Grades Authority:
1. NLGA - Standard Grading Rules for Canadian Lumber.
- G. Northeastern Lumber Manufacturers Association:
1. NELMA - Standard Grading Rules for Northeastern Lumber.
- H. The Redwood Inspection Service:
1. RIS - Standard Specifications for Grades of California Redwood Lumber.
- I. Southern Pine Inspection Bureau:
1. SPIB - Standard Grading Rules for Southern Pine Lumber.
- J. Underwriters Laboratories Inc.:
1. UL 723 - Tests for Surface Burning Characteristics of Building Materials.
- K. West Coast Lumber Inspection Bureau:
1. WCLIB - Standard Grading Rules for West Coast Lumber.
- L. Western Wood Products Association:
1. WWPA G-5 - Western Lumber Grading Rules.

### 1.3 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Submittal procedures.
- B. Shop Drawings For Site Fabricated Truss Frame: Indicate dimensions, wood species and grades, component profiles, drilled holes, fasteners, connectors, erection details and sequence.
- C. Product Data: Submit technical data on insulated sheathing, wood preservative materials, and application instructions.

### 1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with the following:
1. Lumber Grading Agency: Certified by DOC PS 20.
  2. Wood Structural Panel Grading Agency: Certified by EWA - The Engineered Wood Association.
  3. Lumber: DOC PS 20.
  4. Wood Structural Panels: DOC PS 1 or DOC PS 2.

### 1.5 DELIVERY, STORAGE, AND HANDLING

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- A. Section 016000 - Product Requirements: Product storage and handling requirements.
- B. Protect trusses from warping or other distortion by stacking in vertical position, braced to resist movement.

## PART 2 PRODUCTS

### 2.1 LUMBER MATERIALS

- A. Lumber Grading Rules: American Softwood Lumber Standard DOC PS 20
- B. Beam Framing: SPF species, No. 2 grade, 19 percent maximum moisture content.
- C. Joist Framing: SPF species, No. 2 grade, 19 percent maximum moisture content.
- D. Rafter Framing: SPF species, No. 2 grade, 19 percent maximum moisture content.

### 2.2 SHEATHING MATERIALS

- A. Wood Structural Panel Roof Sheathing: EWA Rated Sheathing, Structural I, Plywood, Span Rating 48/24; Exposure Durability 1 or Exterior
- B. Wood Structural Panel Wall Sheathing: EWA Rated Sheathing, Structural I, Plywood, Span Rating 48/24; Exposure Durability 1 or Exterior
- C. Wood Structural Panel Floor Sheathing: EWA Rated Sheathing, Structural I, Plywood, Span Rating 48/24

### 2.3 UNDERLAYMENT MATERIALS

- A. Plywood Underlayment: EWA Structural I

### 2.4 SHEATHING AND UNDERLAYMENT LOCATIONS

- A. Sloped Roof Sheathing: 5/8 inch thick, Span Rating 48/24, 48 x 96 inch sized sheets, square edges.
- B. Flat Roof Sheathing: 5/8 inch thick, Span Rating 48/24, 48 x 96 inch sized sheets, square edges.
- C. Floor Sheathing: 3/4 inch thick, Span Rating 48/24, 48 x 96 inch sized sheets, tongue and groove edges.

### 2.5 ACCESSORIES

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- A. Fasteners and Anchors:
  - 1. Fasteners: Hot dipped galvanized steel for high humidity and treated wood locations, unfinished steel elsewhere.
  - 2. Nails and Staples: ASTM F1667.
- B. Structural Framing Connectors: Hot dipped galvanized steel, sized to suit framing conditions, manufactured by Simpson Strong Tie or equivalent.

## 2.6 FACTORY WOOD TREATMENT

- A. Wood Preservative (Pressure Treatment): AWWA Treatment C1 using water borne preservative with 0.25 percent retainage.
- B. Moisture Content After Treatment:
  - 1. Lumber: Maximum 19 percent.
  - 2. Structural Panels: Maximum 15 percent.

## PART 3 EXECUTION

### 3.1 FRAMING

- A. Set structural members level and plumb, in correct position.
- B. Fasten framing in accordance with applicable code.
- C. Make provisions for erection loads, and for sufficient temporary bracing to maintain structure safe, plumb, and in alignment until completion of erection and installation of permanent bracing.
- D. Place horizontal members, crown side up.
- E. Construct load bearing framing members full length without splices.
- F. Double members at openings over 24 inches wide. Space short studs over and under opening to stud spacing.
- G. Construct double joist headers at floor and ceiling openings and under wall stud partitions parallel to floor joists. Frame rigidly into joists.
- H. Bridge framing in excess of 8 feet in span at mid-span. Fit solid blocking at ends of members.
- I. Coordinate installation of wood decking, wood chord metal joists, glue laminated structural units, prefabricated wood trusses, and wood "I" joists.

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### 3.2 SHEATHING

- A. Fasten sheathing in accordance with applicable code.
- B. Secure roof sheathing with longer edge (strength axis) perpendicular to framing members and with ends staggered and sheet ends over bearing.
- C. Use sheathing clips between sheets between roof framing members.
- D. Secure wall sheathing with long dimension parallel to wall studs, with ends over firm bearing.

### 3.3 FIREBLOCKING AND DRAFTSTOPPING

- A. Install fireblocking to cut off concealed draft openings.
  - 1. Concealed Framed Wall and Furred Spaces: Install fireblocking vertically at floor and ceiling levels and horizontally at maximum 10 feet on center.
  - 2. Connections Between Horizontal and Vertical Spaces: Install fireblocking between vertical walls and partitions and the following:
    - a. Horizontal floor and roof framing.
    - b. Soffits, dropped ceilings, cove ceilings and other horizontal concealed spaces.
  - 3. Stairs: Install fireblocking between stair stringers at top and bottom of each run.

### 3.4 TOLERANCES

- A. Section 014000 - Quality Requirements: Tolerances.
- B. Framing Members: 1/4 inch from indicated position, maximum.
- C. Surface Flatness of Floor: 1/4 inch in 10 feet maximum, and 1/2 inch in 30 feet maximum.

END OF SECTION

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SECTION 06 15 00

WOOD DECKING

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes [softwood lumber] [plywood] [glue laminated] structural wood decking and preservative treatment of wood.

1.2 REFERENCES

- A. APA/Engineered Wood Association:
  - 1. APA -Rated Sheathing.
- B. American Wood Preservers Association:
  - 1. AWPA C1 -All Timber Products Preservative Treatment by Pressure Process.
  - 2. AWPA C20 -Structural Lumber Fire Retardant Treatment by Pressure Process.

1.3 SYSTEM DESCRIPTION

- A. Design roof live and dead load: LL= 20 psf and DL= 10 psf with deflection limited to 1/240 32/16 of span.

1.4 SUBMITTALS

- A. Shop Drawings: Indicate deck framing system, loads and cambers, bearing details, and framed openings.

1.5 QUALITY ASSURANCE

- A. Perform Work in accordance with the following:
  - 1. Lumber Grading Agency: Certified by DOC PS 20.
  - 2. Wood Structural Panel Grading Agency: Certified by EWA -The Engineered Wood Association.
  - 3. Lumber: DOC PS 20.
  - 4. Wood Structural Panels: DOC PS 1

1.6 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience and certified by AITC.

Wood Decking  
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Chanin Engineering, LLC

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## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

- A. Manufacturers:
  - 1. Georgia Pacific Corp.
  - 2. Louisiana-Pacific Corp.

### 2.2 MATERIALS

- A. Plywood: APA/EWA[Rated Sheathing , Span Rating 32/16

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Verify support framing is ready to receive decking.

### 3.2 PREPARATION

- A. Coordinate placement of bearing items.

### 3.3 INSTALLATION -PLYWOOD DECKING

- A. Install decking perpendicular to framing members, with ends staggered over firm bearing. On sloped surfaces, lay decking with tongue upward.
- B. Engage plywood tongue and groove edges.
- C. Allow expansion space at edges and ends.
- D. Attach decking with 8d nails.
- E. Use sheathing clips at unsupported edges of plywood between supporting framing members.
- F. Cut decking to accommodate roof drain and flange.

END OF SECTION



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SECTION 06 17 53

WOOD TRUSSES

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes shop fabricated wood trusses for roof and floor framing; bridging, bracing, and anchorage; and preservative treatment of wood.

1.2 REFERENCES

- A. American National Standards Institute:
  - 1. ANSI A208.1 - Mat-Formed Wood Particleboard.
- B. APA-The Engineered Wood Association:
  - 1. APA/EWA TB 200 - Fire Retardant Treated Plywood.
- C. American Wood-Preservers' Association:
  - 1. A WPA C1 - All Timber Products - Preservative Treatment by Pressure Process.
  - 2. A WPA C20 - Structural Lumber - Fire-Retardant Treatment by Pressure Processes.
- D. ASTM International:
  - 1. ASTM A167 - Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
  - 2. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
  - 3. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.
- E. National Fire Protection Association:
  - 1. NFPA 255 - Standard Method of Test of Surface Burning Characteristics of Building Materials.
- F. The Redwood Inspection Service:
  - 1. RIS - Standard Specifications for Grades of California Redwood Lumber.
- G. Southern Pine Inspection Bureau:
  - 1. SPIB - Standard Grading Rules for Southern Pine Lumber.
- H. Truss Plate Institute:

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1. TPI 1 - National Design Standard for Metal Plate Connected Wood Truss Construction.
- I. Underwriters Laboratories Inc.:
  1. UL 723 - Tests for Surface Burning Characteristics of Building Materials.
- J. U. S Department of Commerce National Institute of Standards and Technology:
  1. DOC PS 1 - Construction and Industrial Plywood.
  2. DOC PS 2 - Performance Standard for Wood-Based Structural-Use Panels.
  3. DOC PS 20 - American Softwood Lumber Standard.
- K. West Coast Lumber Inspection Bureau:
  1. WCLIB - Standard Grading Rules for West Coast Lumber.
- L. Western Wood Products Association:
  1. WWPA G-5 - Western Lumber Grading Rules.

### 1.3 SYSTEM DESCRIPTION

- A. Design Floor Live and Dead Load: as indicated on drawings with deflection limited to 1/360 of span.
- B. Design Roof Live and Dead Load: as indicated on drawings with deflection limited to 1/240 of span including ceiling load.

### 1.4 SUBMITTALS

- A. Section {013300 - Submittal Procedures}: Submittal procedures.
- B. Shop Drawings: Indicate sizes and spacing of trusses and associated components, web and chord sizes, plate sizes, fastener descriptions and spacings, loads and truss cambers, framed openings, and end reactions. Submit design calculations.
- C. Product Data: Submit truss configurations, bearing and anchor details, bridging and bracing.

### 1.5 QUALITY ASSURANCE

- A. Perform Work in accordance with the following:
  1. Lumber Grading Agency: Certified by DOC PS 20.
  2. Plywood Grading Agency: Certified by APA/EWA.
  3. Lumber: DOC PS 20.
  4. Wood Structural Panels: DOC PS 1 or DOC PS 2.
- B. Truss Design, Fabrication, and Installation: In accordance with TPI 1.

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- C. Fire Rated Floor and Roof Construction: Rating as indicated on Architectural Drawings.
  - 1. Tested Rating: Determined in accordance with ASTM E119.
- D. Maintain one copy of each document on site.

#### 1.6 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.
- B. Design trusses under direct supervision of Professional Engineer experienced in design of this Work and licensed in State of Texas.

#### 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Section {016000 - Product Requirements}: Product storage and handling requirements.
- B. Store truss depth in vertical position resting on intermittent bearing pads.

### PART 2 PRODUCTS

#### 2.1 MATERIALS

- A. Lumber Grading Rules: SPIB

#### 2.2 FABRICATION

- A. Fabricate trusses to achieve structural requirements specified.
- B. Fabricate bottom and top chord extensions as indicated on Drawings.
- C. Frame special sized openings in web framing as indicated on Drawings.

#### 2.3 SOURCE QUALITY CONTROL

- A. Section {014000 - Quality Requirements}: Testing, inspection and analysis requirements.
- B. Inspect Work performed at fabricator's facility to verify conformance to Contract Documents.
- C. When fabricator is approved by authority having jurisdiction, submit certificate of compliance indicating Work performed at fabricator's facility conforms to Contract Documents.
  - 1. Specified shop inspections are not required for Work performed by approved fabricator.

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### PART 3 EXECUTION

#### 3.1 EXAMINATION

- A. Section {013000 - Administrative Requirements}: Coordination and project conditions.
- B. Verify supports and openings are ready to receive trusses.

#### 3.2 PREPARATION

- A. Coordinate placement of [bearing] [support] items.

#### 3.3 ERECTION

- A. Set members level and plumb, in correct position.
- B. Make provisions for erection loads, and for sufficient temporary bracing to maintain structure plumb, and in alignment until completion of erection and installation of permanent bracing.
- C. Do not field cut or alter structural members without approval of Architect/Engineer.
- D. Place headers and supports to frame openings.
- E. Frame openings between trusses with lumber in accordance with Section [061000].] [06114].
- F. Coordinate placement of sheathing with work of this Section.
- G. After erection, touch-up damaged surfaces with primer consistent with shop coat.

#### 3.4 ERECTION TOLERANCES

- A. Section {014000 - Quality Requirements}: Tolerances.
- B. Framing Members: 1/2 inch maximum, from indicated position.

END OF SECTION

SECTION 31 05 13

SOILS FOR EARTHWORK

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Subsoil materials.
2. Topsoil materials.

B. Related Sections:

1. Section 310513 - Aggregates for Earthwork.
2. Section 320516 - Aggregates for Exterior Improvements.
3. Section 312213 - Rough Grading.
4. Section 312323 - Backfill.
5. Section 312317 - Trenching.

1.2 REFERENCES

A. American Association of State Highway and Transportation Officials:

1. AASHTO T180 - Standard Specification for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in.) Drop.

B. ASTM International:

1. ASTM D698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft<sup>3</sup> (600 kN-m/m<sup>3</sup>)).
2. ASTM D1557 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (6,000 ft-lbf/ft<sup>3</sup> (2,700 kN-m/m<sup>3</sup>)).
3. ASTM D2487 - Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System).

PART 2 PRODUCTS

2.1 SOURCE QUALITY CONTROL

A. Section 014000 - Quality Requirements: Testing and Inspection Services Testing and analysis of soil material.

B. Testing and Analysis of Subsoil Material: Perform in accordance with ASTM D698.

C. Testing and Analysis of Topsoil Material: Perform in accordance with ASTM D698.

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- D. When tests indicate materials do not meet specified requirements, change material and retest.
- E. Furnish materials of each type from same source throughout the Work.

### PART 3 EXECUTION

#### 3.1 EXCAVATION

- A. Excavate subsoil and topsoil from areas designated. Strip topsoil to full depth of topsoil in designated areas.
- B. Stockpile excavated material meeting requirements for subsoil materials and topsoil materials.
- C. Remove excess excavated materials subsoil and topsoil not intended for reuse, from site.
- D. Remove excavated materials not meeting requirements for subsoil materials and topsoil materials from site.

#### 3.2 STOCKPILING

- A. Stockpile materials on site at locations designated by Architect/Engineer.
- B. Stockpile in sufficient quantities to meet Project schedule and requirements.
- C. Separate differing materials with dividers or stockpile apart to prevent mixing.
- D. Prevent intermixing of soil types or contamination.
- E. Direct surface water away from stockpile site to prevent erosion or deterioration of materials.

#### 3.3 STOCKPILE CLEANUP

- A. Remove stockpile, leave area in clean and neat condition. Grade site surface to prevent free standing surface water.

END OF SECTION

SECTION 31 10 00

SITE CLEARING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
  - 1. Removing surface debris.
  - 2. Removing designated trees, shrubs, and other plant life.
  - 3. Removing abandoned utilities.
  - 4. Excavating topsoil.
- B. Related Sections:
  - 1. Section 312213 - Rough Grading.
  - 2. Section 312318 - Rock Removal.

PART 2 EXECUTION

2.1 EXAMINATION

- A. Section 013000 - Administrative Requirements: Verification of existing conditions before starting work.
- B. Verify existing plant life designated to remain is tagged or identified.
- C. Identify waste area for placing removed materials.

2.2 PREPARATION

- A. Call Local Utility Line Information not less than three working days before performing Work.
  - 1. Request underground utilities to be located and marked within and surrounding construction areas.

2.3 PROTECTION

- A. Locate, identify, and protect utilities indicated to remain, from damage.
- B. Protect trees, plant growth, and features designated to remain, as final landscaping
- C. Protect bench marks, survey control points, and existing structures from damage or displacement.

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2.4 CLEARING

- A. Clear areas required for access to site and execution of Work.
- B. Remove trees and shrubs within marked areas. Remove stumps.
- C. Clear undergrowth and deadwood, without disturbing subsoil.
- D. Apply herbicide to remaining stumps to inhibit growth.

2.5 REMOVAL

- A. Remove debris, rock, and extracted plant life from site.
- B. Remove abandoned utilities. Indicated removal termination point for underground utilities on Record Documents.
- C. Continuously clean-up and remove waste materials from site. Do not allow materials to accumulate on site.
- D. Do not burn or bury materials on site. Leave site in clean condition.

2.6 TOPSOIL EXCAVATION

- A. Excavate topsoil from areas to be further excavated, relandscaped, or regraded, without mixing with foreign materials for use in finish grading.
- B. Do not excavate wet topsoil.
- C. Stockpile in area designated on site to depth not exceeding 8 feet and protect from erosion.
- D. Remove excess topsoil not intended for reuse, from site.

END OF SECTION



SECTION 31 22 13

ROUGH GRADING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
  - 1. Excavating topsoil.
  - 2. Excavating subsoil.
  - 3. Cutting, grading, filling, compacting site for site structures, building pads.
  
- B. Related Sections:
  - 1. Section 310513 - Soils for Earthwork: Soils for fill.
  - 2. Section 310516 - Aggregates for Earthwork: Aggregates for fill.
  - 3. Section 311000 - Site Clearing: Excavating topsoil.
  - 4. Section 312316 - Excavation and Fill: Building excavation.
  - 5. Section 312318 - Rock Removal.
  - 6. Section 312323 - Backfill: General building area backfilling.
  - 7. Section 312317 - Trenching: Trenching and backfilling for utilities.

1.2 REFERENCES

- A. American Association of State Highway and Transportation Officials:
  - 1. AASHTO T180 - Standard Specification for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in.) Drop.
  
- B. ASTM International:
  - 1. ASTM C136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
  - 2. ASTM D698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft<sup>3</sup> (600 kN-m/m<sup>3</sup>)).
  - 3. ASTM D1556 - Standard Test Method for Density of Soil in Place by the Sand-Cone Method.
  - 4. ASTM D1557 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (6,000 ft-lbf/ft<sup>3</sup> (2,700 kN-m/m<sup>3</sup>)).
  - 5. ASTM D2167 - Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.
  - 6. ASTM D2419 - Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregate.
  - 7. ASTM D2434 - Standard Test Method for Permeability of Granular Soils (Constant Head).
  - 8. ASTM D2922 - Standard Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

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9. ASTM D3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).

## PART 2 EXECUTION

### 2.1 PREPARATION

- A. Call Local Utility Line Information service not less than three working days before performing Work.
  1. Request underground utilities to be located and marked within and surrounding construction areas.
- B. Identify required lines, levels, contours, and datum.
- C. Protect utilities indicated to remain from damage.
- D. Protect bench marks, survey control point, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.

### 2.2 FILLING

- A. Fill areas to contours and elevations with unfrozen materials.
- B. Place fill material in continuous layers and compact as required.
- C. Maintain optimum moisture content of fill materials to attain required compaction density.
- D. Slope grade away from building minimum 2 percent slope for minimum distance of 10 ft, unless noted otherwise.
- E. Make grade changes gradual. Blend slope into level areas.

### 2.3 FIELD QUALITY CONTROL

- A. Perform in place compaction tests in accordance with the following:
  1. As required by geotechnical engineer.

END OF SECTION

SECTION 31 23 16

EXCAVATION AND FILL

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
  - 1. Soil densification.
  - 2. Excavating for building foundations.
  - 3. Excavating for slabs-on-grade.
  - 4. Excavating for site structures.
  
- B. Related Sections:
  - 1. Section 310513 - Soils for Earthwork: Stockpiling excavated materials.
  - 2. Section 310516 - Aggregates for Earthwork: Stockpiling excavated materials.
  - 3. Section 312213 - Rough Grading: Topsoil and subsoil removal from site surface.
  - 4. Section 312318- Rock Removal: Removal of rock during excavating.
  - 5. Section 312323- Backfill.
  - 6. Section 312317 - Trenching: Excavating for utility trenches.

1.2 REFERENCES

- A. ASTM International:
  - 1. ASTM D698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft<sup>3</sup> (600 kN-m/m<sup>3</sup>)).
  - 2. ASTM D1556 - Standard Test Method for Density of Soil in Place by the Sand-Cone Method.
  - 3. ASTM D2167 - Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.
  - 4. ASTM D2922 - Standard Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
  
- B. Local utility standards when working within 24 inches of utility lines.

PART 2 EXECUTION

2.1 EXCAVATION

- A. Underpin adjacent structures which may be damaged by excavation work.
  
- B. Excavate subsoil to accommodate building foundations, slabs-on-grade.
  
- C. Excavate to working elevation for piling work.

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- D. Compact disturbed load bearing soil in direct contact with foundations to original bearing capacity; perform compaction in accordance with Section 02320 and Section 02324.
- E. Grade top perimeter of excavation to prevent surface water from draining into excavation.
- F. Trim excavation. Remove loose matter.
- G. Notify Architect/Engineer of unexpected subsurface conditions.
- H. Correct areas over excavated with structural fill.
- I. Remove excess and unsuitable material from site.
- J. Repair or replace items indicated to remain damaged by excavation.

2.2 PROTECTION

- A. Prevent displacement or loose soil from falling into excavation; maintain soil stability.
- B. Protect bottom of excavations and soil adjacent to and beneath foundation from freezing.
- C. Protect structures, utilities and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth operations.

END OF SECTION

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SECTION 31 31 16  
TERMITE CONTROL

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
  - 1. Soil treatment for termite control.
- B. Related Sections:
  - 1. Section 310513 - Soils for Earthwork: Backfill materials.
  - 2. Section 312316 - Excavation and Fill: Subgrade preparation.
  - 3. Section 033000 - Cast-In-Place Concrete: Slabs on grade and foundations placed over treated soil.

1.2 REFERENCES

- A. Environmental Protection Agency:
  - 1. EPA FIFRA - Federal Insecticide, Fungicide and Rodenticide Act.
- B. National Pest Management Association:
  - 1. NPMA WDO - Wood Destroying Organism Library.

1.3 SUBMITTALS

- A. Product Data: Submit toxicants to be used, composition by percentage, dilution schedule, intended application rate. Include product label information.
- B. Test Reports: Indicate regulatory agency approval reports.
- C. Manufacturer's Application Instructions: Indicate caution requirements and in accordance with current product label of chosen pesticide.
- D. Certify applications followed NPMA WDO for termite control or other regional location guidance.

1.4 CLOSEOUT SUBMITTALS

- A. Project Record Documents: Record moisture content of soil before application, date and rate of application, areas of application, diary of toxicity meter readings and corresponding soil coverage.
- B. Operation and Maintenance Data: Indicate re-treatment schedule.

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#### 1.5 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three years documented experience.
- B. Applicator: Company specializing in performing the Work of this section and licensed in State of Texas.

#### 1.6 SEQUENCING

- A. Section 011000 - Summary: Work sequence.
- B. Apply toxicant immediately prior to installation of vapor barrier under slabs-on-grade in accordance with product label supplemented by the NPCA's ARP for termiticiding or local requirements.

#### 1.7 WARRANTY

- A. Warranty: Include coverage for damage and repairs to building and building contents caused by termites. Repair damage. Re-treat where required.

### PART 2 PRODUCTS

#### 2.1 MATERIALS

- A. Toxicant Chemical: EPA FIFRA approved; synthetically color dyed to permit visual identification of treated soil.
- B. Diluent: Recommended by toxicant manufacturer.

#### 2.2 MIXES

- A. Mix toxicant to manufacturer's instructions.

### PART 3 EXECUTION

#### 3.1 EXAMINATION

- A. Section 013000 - Administrative Requirements: Verification of existing conditions before starting work.
- B. Verify soil surfaces are unfrozen, sufficiently dry to absorb toxicant, and ready to receive treatment.
- C. Verify final grading and excavation are complete.

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### 3.2 APPLICATION

- A. Apply toxicant at locations indicated in Schedule at end of section.
- B. Apply extra treatment to structure penetration surfaces including pipe or ducts, and soil penetrations including grounding rods or posts.
- C. Re-treat disturbed treated soil with same toxicant as original treatment.
- D. When inspection or testing identifies presence of termites, re-treat soil and re-test.

### 3.3 PROTECTION OF FINISHED WORK

- A. Section 017000 - Execution Requirements: Protecting finished Work.
- B. Do not permit soil grading over treated work.

END OF SECTION

APPENDIX "C"

9/10/2018



**DIVISION 15**

- 15010 SUMMARY OF MECHANICAL WORK
- 15050 BASIC MECHANICAL MATERIALS AND METHODS
- 15060 HANGERS AND SUPPORTS
- 15075 MECHANICAL IDENTIFICATION
- 15081 DUCT INSULATION
- 15083 PIPE INSULATION
- 15110 VALVES
- 15140 DOMESTIC WATER PIPING
- 15150 SANITARY WASTE AND VENT PIPING
- 15410 PLUMBING FIXTURES
- 15415 DRINKING FOUNTAINS AND WATER COOLERS
- 15430 PLUMBING SPECIALTIES
- 15485 ELECTRIC, DOMESTIC WATER HEATERS
- 15815 METAL DUCTS
- 15820 DUCT ACCESSORIES
- 15837 CENTRIFUGAL FANS
- 15855 DIFFUSERS, REGISTERS, AND GRILLES
- 15990 TESTING, ADJUSTING, BALANCING

**DIVISION 16**

- 16010 SUMMARY OF ELECTRICAL WORK
- 16020 BASIC ELECTRICAL REQUIREMENTS
- 16050 BASIC ELECTRICAL MATERIALS AND METHODS
- 16055 SITE ELECTRICAL
- 16060 GROUNDING AND BONDING
- 16075 ELECTRICAL IDENTIFICATION
- 16120 BUILDING WIRE AND CABLE
- 16130 RACEWAYS AND BOXES
- 16140 WIRING DEVICES
- 16190 SUPPORTING DEVICES
- 16440 DISCONNECT SWITCHES
- 16442 PANELBOARDS
- 16475 FUSES
- 16511 INTERIOR LIGHTING
- 16521 EXTERIOR LIGHTING
- 16900 EQUIPMENT CONNECTIONS AND CONTROL WIRING



**DIVISION 15010**  
**SUMMARY OF MECHANICAL WORK**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, Division 1 Specification Sections and other Division 15 Specification Sections, apply to this Section.

**1.2 WORK COVERED BY CONTRACT DOCUMENTS**

- A. The following Summary of Work is intended as an aid to achieve an understanding of the various elements of work included in the project, as is not intended to be all-inclusive. Detailed descriptions of work and requirements are given in drawings and specifications.

- B. Mechanical Contract Documents were prepared for the Project by:

Trinity MEP Engineering, LLC  
3533 Moreland Dr. Ste. A  
Weslaco, Texas 78596  
Phone Number: (956) 973-0500  
Contact Person: Leonardo Munoz, P.E.

- C. General Scope of Work:
1. Install AC equipment and ductwork as shown on the contract documents. Refer to drawings for schedule of equipment that will be installed. After installing equipment, connect power to unit.
  2. HVAC: Provide all materials and labor associated with a complete operational installation of new HVAC systems including, but not limited to:
    - Exhaust fans
    - Sheet metal, Ductwork
    - Diffusers and Grilles
    - Duct accessories, including grilles, and louvers
    - Air Test and Balance
  3. Plumbing: Provide all materials and labor associated with a complete operational installation of new Plumbing systems including, but not limited to:
    - Plumbing Fixtures for facility
    - Piping for Sanitary Sewer and Vent Systems
    - Piping for Domestic water and Hot Water Systems.

**1.3 CONTINGENCY**

1. Refer to architectural specifications for Mechanical Contingencies.

#### **1.4 COORDINATION**

- A. All mechanical work shall be done under sub-contract to a General Contractor. Mechanical Contractor shall coordinate all work through General Contractor, even in areas where only mechanical work is to take place.
- B. Coordination between all trades shall take place on a regular basis to avoid conflicts between disciplines and equipment clearances.
- C. Work shall take place with minimal disruption to Owner's operations in areas surrounding the new building.
- D. Cooperate fully with other contractors so that work under those contracts may be carried out smoothly, without interfering with or delaying work under this Contract.
- E. Fully coordinate with electrical contractor for providing power to mechanical equipment.
- F. Mechanical Contractor is responsible for all control wiring including thermostat(s). This includes all conduit, wire, and accessories both low voltage and source voltage for the controls' system. Mechanical Contractor will provide all the necessary actuators, relays, software, hardware, and all necessary accessories required for a fully functional controls' system.

#### **1.5 UTILITIES**

- 1. Coordinate with power, water, telephone, cable and gas utilities to locate all utilities prior to digging in any area.
- 2. Obtain any approvals required from utilities to relocate utilities.
- 3. Cost of relocating or bypassing utilities indicated on drawings shall be included in Base Bid.

#### **1.6 CONTRACTOR USE OF PREMISES**

- A. Use of the Site: Limit use of the premises to work in areas indicated. Confine operations to areas within contract limits indicated. Do not disturb portions of the site beyond the areas in which the Work is indicated.
  - 1. Owner Occupancy: Allow for Owner occupancy and use by the public.
  - 2. Driveways and Entrances: Keep driveways and entrances serving the premises, clear and available to the Owner, the Owner's employees, and emergency vehicles at all time. Do not use these areas for parking or storage of materials. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.
- B. Site Safety: Take every precaution to ensure the site does not present a threat to the safety of occupants and/or workers. Minimal safety requirements include, but are not limited to the following:
  - 1. Temporary fencing around construction areas.
  - 2. Yellow caution tape and construction barricades along open trenches during the day. Trenches shall be covered at night and warning lights provided on construction barricades.

3. Temporary fencing around equipment while site work is in progress.

1.7

**SUBMITTALS**

1. To expedite the submittal process more efficiently, DO NOT piece-meal the submittals. Submit entire mechanical or plumbing in a bound enclosure. This will eliminate delays in the submittal process.

**END OF SECTION**

**DIVISION 15050**  
**BASIC MECHANICAL MATERIALS AND METHODS**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. This Section includes the following basic mechanical materials and methods to complement other Division 15 Sections.
  - 1. Piping materials and installation instructions common to most piping systems.
  - 2. Concrete base construction requirements.
  - 3. Escutcheons.
  - 4. Dielectric fittings.
  - 5. Flexible connectors.
  - 6. Mechanical sleeve seals.
  - 7. Equipment nameplate data requirements.
  - 8. Nonshrink grout for equipment installations.
  - 9. Field-fabricated metal and wood equipment supports.
  - 10. Installation requirements common to equipment specification sections.
  - 11. Cutting and patching.
  - 12. Touchup painting and finishing.

**1.3 DEFINITIONS**

- A. Finished Spaces: Spaces other than mechanical and electrical equipment rooms, furred spaces, pipe and duct shafts, unheated spaces immediately below roof, spaces above ceilings, unexcavated spaces, crawl spaces, and tunnels.
- B. Exposed, Interior Installations: Exposed to view indoors. Examples include finished occupied spaces and mechanical equipment rooms.
- C. Exposed, Exterior Installations: Exposed to view outdoors, or subject to outdoor ambient temperatures and weather conditions. Examples include rooftop locations.
- D. Concealed, Interior Installations: Concealed from view and protected from physical contact by building occupants. Examples include above ceilings and in duct shafts.
- E. Concealed, Exterior Installations: Concealed from view and protected from weather conditions and physical contact by building occupants, but subject to outdoor ambient temperatures. Examples include installations within unheated shelters.
- F. The following are industry abbreviations for plastic materials:

1. PVC: Polyvinyl chloride plastic.
- G. The following are industry abbreviations for rubber materials:
1. EPDM: Ethylene propylene diene terpolymer rubber.

#### **1.4 SUBMITTALS**

- A. Product Data: For dielectric fittings, flexible connectors, mechanical sleeve seals, and identification materials and devices.
- B. Coordination Drawings: Detail major elements, components, and systems of mechanical equipment and materials in relationship with other systems, installations, and building components. Show space requirements for installation and access. Indicate if sequence and coordination of installations are important to efficient flow of the Work. Include the following:
1. Planned piping layout, including valve and specialty locations and valve-stem movement.
  2. Clearances for servicing and maintaining equipment, accessories, and specialties, including space for disassembly required for periodic maintenance.
  3. Sizes and location of required concrete pads and bases.
  4. Floor plans, elevations, and details to indicate penetrations in floors, walls, and ceilings and their relationship to other penetrations and installations.
  5. Reflected ceiling plans to coordinate and integrate installation of air outlets and inlets, light fixtures, communication system components, sprinklers, and other ceiling-mounted items.

#### **1.5 QUALITY ASSURANCE**

- A. Comply with ASME A13.1 for lettering size, length of color field, colors, and viewing angles of identification devices.
- B. Equipment Selection: Equipment of higher electrical characteristics, physical dimensions, capacities, and ratings may be furnished provided such proposed equipment is approved in writing and connecting mechanical and electrical services, circuit breakers, conduit, motors, bases, and equipment spaces are increased. Additional costs shall be approved in advance by appropriate Contract Modification for these increases. If minimum energy ratings or efficiencies of equipment are specified, equipment must meet design and commissioning requirements.

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

- A. Deliver pipes and tubes with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe end damage and prevent entrance of dirt, debris, and moisture.

- B. Protect stored pipes, ductwork, equipment, and tubes from moisture and dirt. Elevate above grade. Do not exceed structural capacity of floor, if stored inside.
- C. Protect flanges, fittings, and piping specialties from moisture and dirt.
- D. Store plastic pipes protected from direct sunlight. Support to prevent sagging and bending.

#### **1.7 SEQUENCING AND SCHEDULING**

- A. Coordinate mechanical equipment installation with other building components.
- B. Arrange for pipe spaces, chases, slots, and openings in building structure during progress of construction to allow for mechanical installations.
- C. Coordinate installation of required supporting devices and set sleeves in poured-in-place concrete and other structural components, as they are constructed.
- D. Sequence, coordinate, and integrate installations of mechanical materials and equipment for efficient flow of the Work. Coordinate installation of large equipment requiring positioning before closing in building.
- E. Coordinate connection of mechanical systems with exterior underground and overhead utilities and services. Comply with requirements of governing regulations, franchised service companies, and controlling agencies.
- F. Coordinate requirements for access panels and doors if mechanical items requiring access are concealed behind finished surfaces. Access panels and doors are specified in Division 8.
- G. Coordinate installation of identifying devices after completing covering and painting, if devices are applied to surfaces. Install identifying devices before installing acoustical ceilings and similar concealment.

#### **1.8 OPERATION PRIOR TO ACCEPTANCE**

- A. When any equipment is operable, and it is to the advantage of the Contractor to operate the equipment, he may do so provided that he properly supervises the operation, and retains full responsibility for the equipment operated.
- B. Regardless of whether or not the equipment has or has not been operated, the Contractor shall clean the equipment properly, make required adjustments, and complete punch list items before final acceptance by the Owner.
- C. The date of acceptance by the Engineer, for beneficial use by the Owner, shall be the beginning date of the warranty period.

#### **1.9 SPACE AND EQUIPMENT ARRANGEMENT**

- A. The size of each item of mechanical equipment shown on the Drawings is based on the dimensions of a particular manufacturer as indicated. While other manufacturers

may be acceptable, it shall be the responsibility of the Contractor to determine whether or not the equipment he proposes to furnish will fit into the space. Shop drawings shall be prepared when required by the engineer to indicate a suitable arrangement.

- B. Install equipment in a manner to permit access to all surfaces. Install valves, motors, drives, lubricating devices, filters, and other accessory items in a position to allow removal for service without requiring the disassembly of another part.
- C. Provide access panels acceptable to the Engineer for equipment that is concealed above ceiling space.
- D. Large equipment assemblies or components which will be installed in the building, and which are too large to permit access through doorways, stairways or shafts, shall be brought to the site and placed in the appropriate spaces before the enclosing structure is completed. Provisions shall be implemented by the Contractor to insure that the equipment will not be damaged in any way during the associated construction procedures.

#### **1.10 START-UP OF EQUIPMENT AND SYSTEMS**

- A. Whenever the manufacturer of a particular item of equipment or a particular system makes available a start-up service after completion of the installation, such manufacturer's start-up service (rendered by the manufacturer or his authorized representative) shall be provided.
- B. Witnessing and explanations of start-up services shall be included as part of the "Instruction of Owner's Personnel" as specified below.

#### **1.11 INSTRUCTION OF OWNER'S PERSONNEL**

- A. Provide the services of competent engineers or technicians acceptable to the Engineer to instruct representatives of the Owner in complete and detailed operation and maintenance of each item of equipment, and each system. These instructions shall be provided for whatever periods may be necessary to accomplish the desired results. Upon completion of these instructions, the Contractor shall obtain a letter of release, acknowledged by the Owner or his authorized representative, stating the dates on which the various kinds of instruction were given, and the personnel to whom the instructions were given.
- B. The Contractor shall be fully responsible for proper maintenance of equipment and systems until the instructions have been given to the Owner's personnel and the letter of release acknowledged.
- C. In providing the instructions to the Owner's personnel, the written operating and maintenance manuals shall be followed in all instances, and the Owner's personnel shall be familiarized with such manuals. Operating and maintenance manuals used for instructions shall include piping diagrams, valve identification charts, control and interlocking wiring diagrams, manufacturers' operation and maintenance manuals, parts lists (with sources identified), and other data as appropriate for each system, and as required elsewhere in the Specifications to be furnished to the Owner prior to final acceptance of the project.

- D. Provide the Owner with three (3) complete sets of all maintenance manuals, pamphlets, brochures or instructions. This material shall be catalogued, indexed and bound into books.

#### **1.12 ACCEPTABLE MANUFACTURERS**

- A. Provide equipment and materials from listed manufacturers listed within this specification. Deviations from this specification will not be acceptable. When one manufacturer is listed, alternate materials and equipment may be provided "equal to" the listed. When more than one manufacturer is listed, equipment and material must be provided by one of the listed manufacturers.

### **PART 2 - PRODUCTS**

#### **2.1 STANDARD PRODUCTS**

- A. Each item of equipment furnished under this Division of the Specifications shall be essentially the standard product of the manufacturer. Where two or more units of the same kind or class of equipment are required, these shall be the products of a single manufacturer; however, the component parts of the equipment need not be the products of one manufacturer.
- B. Materials and equipment shall be of the base quality normally used in good commercial practice, and shall be the products of reputable domestic manufacturers unless otherwise specified. Each major component shall bear a nameplate giving the name and address of the manufacturer, and the catalog number or designation of the component.

#### **2.2 QUALITY AND CLASSIFICATION OF MATERIALS**

- A. Materials and equipment shall be new and of the quality specified, and shall be free from defects at the time of installation. Materials or equipment damaged in shipment or otherwise damaged prior to installation shall not be repaired at the job site, but shall be replaced with new materials or equipment identical with those damaged.
- B. Wherever a UL standard has been established for a particular type of material or equipment, each such material or equipment provided on this project shall meet the requirements of the UL standard in every way and shall be UL listed and labeled.

#### **2.3 LOCAL PARTS AND SERVICE**

- A. Each item of equipment furnished on this project shall have local representation, factory-authorized service, and an adequate stock of repair parts. "Local" shall be defined, for this purpose, as "within 50 miles of the project site."

#### **2.4 FLAME SPREAD PROPERTIES OF MATERIALS**



- A. Materials used for insulation, acoustical linings, adhesives, jackets and coatings, and combinations of these materials, shall each have a flame spread rating of 25 or less, and a smoke developed rating of 50 or less, as determined by an independent testing laboratory in accordance with NFPA-255.

## **2.5 MANUFACTURERS**

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Dielectric Unions:
    - a. Watts Industries, Inc.; Water Products Div.
    - b. Zurn Industries, Inc.; Wilkins Div.
  - 2. Mechanical Sleeve Seals:
    - a. Calpico, Inc.
    - b. Metraflex Co.
    - c. Thunderline/Link-Seal.

## **2.6 PIPE AND PIPE FITTINGS**

- A. Refer to individual Division 15 piping Sections for pipe and fitting materials and joining methods.
- B. Pipe Threads: ASME B1.20.1 for factory-threaded pipe and pipe fittings.

## **2.7 JOINING MATERIALS**

- A. Refer to individual Division 15 piping Sections for special joining materials not listed below.
- B. Pipe-Flange Gasket Materials: Suitable for chemical and thermal conditions of piping system contents.
  - 1. ASME B16.21, nonmetallic, flat, asbestos-free, 1/8-inch maximum thickness, unless thickness or specific material is indicated.
    - a. Full-Face Type: For flat-face, Class 125, cast-iron and cast-bronze flanges.
    - b. Narrow-Face Type: For raised-face, Class 250, cast-iron and steel flanges.
  - 2. AWWA C110, rubber, flat face, 1/8 inch thick, unless otherwise indicated; and full-face or ring type, unless otherwise indicated.
- C. Flange Bolts and Nuts: ASME B18.2.1, carbon steel, unless otherwise indicated.

- D. Plastic, Pipe-Flange Gasket, Bolts, and Nuts: Type and material recommended by piping system manufacturer, unless otherwise indicated.
- E. Solder Filler Metals: ASTM B 32.
  - 1. Alloy Sn95 or Alloy Sn94: Approximately 95 percent tin and 5 percent silver, with 0.10 percent lead content.
- F. Brazing Filler Metals: AWS A5.8.
  - 1. BCuP Series: Copper-phosphorus alloys.
  - 2. BAg1: Silver alloy.
- G. Welding Filler Metals: Comply with AWS D10.12 for welding materials appropriate for wall thickness and chemical analysis of steel pipe being welded.
- H. Solvent Cements: Manufacturer's standard solvent cements for the following:
  - 1. PVC Piping: ASTM D 2564. Include primer according to ASTM F 656.
  - 2. PVC to ABS Piping Transition: ASTM D 3138.
- I. Plastic Pipe Seals: ASTM F 477, elastomeric gasket.
- J. Flanged, Ductile-Iron Pipe Gasket, Bolts, and Nuts: AWWA C110, rubber gasket, carbon-steel bolts and nuts.
- K. Couplings: Iron-body sleeve assembly, fabricated to match OD of plain-end, pressure pipes.
  - 1. Sleeve: ASTM A 126, Class B, gray iron.
  - 2. Followers: ASTM A 47 malleable iron or ASTM A 536 ductile iron.
  - 3. Gaskets: Rubber.
  - 4. Bolts and Nuts: AWWA C111.
  - 5. Finish: Enamel paint.

## **2.8 DIELECTRIC FITTINGS**

- A. General: Assembly or fitting with insulating material isolating joined dissimilar metals, to prevent galvanic action and stop corrosion.
- B. Description: Combination of copper alloy and ferrous; threaded, solder, plain, and weld-neck end types and matching piping system materials.
- C. Insulating Material: Suitable for system fluid, pressure, and temperature.
- D. Dielectric Unions: Factory-fabricated, union assembly, for 250-psig minimum working pressure at 180 deg F.

## **2.9 MECHANICAL SLEEVE SEALS**

- A. Description: Modular design, with interlocking rubber links shaped to continuously fill annular space between pipe and sleeve. Include connecting bolts and pressure plates.

## **2.10 PIPING SPECIALTIES**

- A. Sleeves: The following materials are for wall, floor, slab, and roof penetrations:
  - 1. Steel Sheet Metal: 0.0239-inch minimum thickness, galvanized, round tube closed with welded longitudinal joint.
  - 2. Steel Pipe: ASTM A 53, Type E, Grade A, Schedule 40, galvanized, plain ends.
  - 3. Cast Iron: Cast or fabricated "wall pipe" equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop, unless otherwise indicated.
  - 4. Stack Sleeve Fittings: Manufactured, cast-iron sleeve with integral clamping flange. Include clamping ring and bolts and nuts for membrane flashing.
    - a. Underdeck Clamp: Clamping ring with set screws.
- B. Escutcheons: Manufactured wall, ceiling, and floor plates; deep-pattern type if required to conceal protruding fittings and sleeves.
  - 1. ID: Closely fit around pipe, tube, and insulation of insulated piping.
  - 2. OD: Completely cover opening.
  - 3. Cast Brass: One piece, with set screw.
    - a. Finish: Rough brass.
    - b. Finish: Polished chrome-plate.
  - 4. Cast-Iron Floor Plate: One-piece casting.

## **2.11 GROUT**

- A. Nonshrink, Nonmetallic Grout: ASTM C 1107, Grade B.
  - 1. Characteristics: Post-hardening, volume-adjusting, dry, hydraulic-cement grout, nonstaining, noncorrosive, nongaseous, and recommended for interior and exterior applications.
  - 2. Design Mix: 5000-psig, 28-day compressive strength.
  - 3. Packaging: Premixed and factory packaged.

## **PART 3 - EXECUTION**

### **3.1 PIPING SYSTEMS - COMMON REQUIREMENTS**

- A. General: Install piping as described below, unless piping Sections specify otherwise. Individual Division 15 piping Sections specify unique piping installation requirements.
- B. General Locations and Arrangements: Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Indicated locations and

arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated, unless deviations to layout are approved on Coordination Drawings.

- C. Install piping at indicated slope.
- D. Install components with pressure rating equal to or greater than system operating pressure.
- E. Install piping in concealed interior and exterior locations, except in equipment rooms and service areas.
- F. Install piping free of sags and bends.
- G. Install exposed interior and exterior piping at right angles or parallel to building walls. Diagonal runs are prohibited, unless otherwise indicated.
- H. Install piping tight to slabs, beams, joists, columns, walls, and other building elements. Allow sufficient space above removable ceiling panels to allow for ceiling panel removal.
- I. Install piping to allow application of insulation plus 1-inch clearance around insulation.
- J. Locate groups of pipes parallel to each other, spaced to permit valve servicing.
- K. Install fittings for changes in direction and branch connections.
- L. Install couplings according to manufacturer's written instructions.
- M. Install pipe escutcheons for pipe penetrations of concrete and masonry walls, wall board partitions, and suspended ceilings according to the following:
  - 1. Chrome-Plated Piping: Cast brass, one piece, with set screw, and polished chrome-plated finish.
  - 2. Uninsulated Piping Wall Escutcheons: Cast brass or stamped steel, with set screw.
  - 3. Uninsulated Piping Floor Plates in Utility Areas: Cast-iron floor plates.
  - 4. Insulated Piping: Cast brass or stamped steel; with concealed hinge, spring clips, and chrome-plated finish.
  - 5. Piping in Utility Areas: Cast brass or stamped steel, with set-screw or spring clips.
- N. Sleeves are not required for core drilled holes.
- O. Install sleeves for pipes passing through concrete and masonry walls, and concrete floor and roof slabs.
- P. Install sleeves for pipes passing through concrete and masonry walls, gypsum-board partitions, and concrete floor and roof slabs.
  - 1. Cut sleeves to length for mounting flush with both surfaces.

- a. Exception: Extend sleeves installed in floors of mechanical equipment areas or other wet areas 2 inches above finished floor level. Extend cast-iron sleeve fittings below floor slab as required to secure clamping ring if ring is specified.
  2. Build sleeves into new walls and slabs as work progresses.
  3. Install sleeves large enough to provide 1/4-inch annular clear space between sleeve and pipe or pipe insulation. Use the following sleeve materials: Steel Pipe Sleeves: For pipes smaller than 6-inch NPS.
    - b. Steel, Sheet-Metal Sleeves: For pipes 6-inch NPS and larger, penetrating gypsum-board partitions.
  4. Except for underground wall penetrations, seal annular space between sleeve and pipe or pipe insulation, using elastomeric joint sealants. Refer to Division 7 for materials.
  5. Use Type S, Grade NS, Class 25, Use O, neutral-curing silicone sealant, unless otherwise indicated.
- Q. Aboveground, Exterior-Wall, Pipe Penetrations: Seal penetrations using sleeves and mechanical sleeve seals. Size sleeve for 1-inch annular clear space between pipe or pipe insulation and sleeve for installing mechanical sleeve seals.
1. Install steel pipe for sleeves smaller than 6 inches in diameter.
  2. Install cast-iron "wall pipes" for sleeves 6 inches in diameter and larger.
  3. Assemble and install mechanical sleeve seals according to manufacturer's written instructions. Tighten bolts that cause rubber sealing elements to expand and make watertight seal.
- R. Underground, Exterior-Wall, Pipe Penetrations: Install cast-iron "wall pipes" for sleeves. Seal pipe penetrations using mechanical sleeve seals. Size sleeve for 1-inch annular clear space between pipe and sleeve for installing mechanical sleeve seals.
1. Assemble and install mechanical sleeve seals according to manufacturer's written instructions. Tighten bolts that cause rubber sealing elements to expand and make watertight seal.
- S. Fire-Barrier Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at pipe penetrations. Seal pipe penetrations with firestopping materials. Refer to Division 7 for materials.
- T. Verify final equipment locations for roughing-in.
- U. Refer to equipment specifications in other Sections of these Specifications for roughing-in requirements.
- V. Piping Joint Construction: Join pipe and fittings as follows and as specifically required in individual piping specification Sections:
1. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.
  2. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.

3. Soldered Joints: Construct joints according to AWS's "Soldering Manual," Chapter "The Soldering of Pipe and Tube"; or CDA's "Copper Tube Handbook."
  4. Brazed Joints: Construct joints according to AWS's "Brazing Handbook," Chapter "Pipe and Tube."
  5. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
    - a. Note internal length of threads in fittings or valve ends, and proximity of internal seat or wall, to determine how far pipe should be threaded into joint.
    - b. Apply appropriate tape or thread compound to external pipe threads, unless dry seal threading is specified.
    - c. Align threads at point of assembly.
    - d. Tighten joint with wrench. Apply wrench to valve end into which pipe is being threaded.
    - e. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.
  6. Welded Joints: Construct joints according to AWS D10.12, "Recommended Practices and Procedures for Welding Low Carbon Steel Pipe," using qualified processes and welding operators according to "Quality Assurance" Article.
  7. Flanged Joints: Align flange surfaces parallel. Select appropriate gasket material, size, type, and thickness for service application. Install gasket concentrically positioned. Assemble joints by sequencing bolt tightening to make initial contact of flanges and gaskets as flat and parallel as possible. Use suitable lubricants on bolt threads. Tighten bolts gradually and uniformly using torque wrench.
  8. Plastic Piping Solvent-Cement Joints: Clean and dry joining surfaces by wiping with clean cloth or paper towels. Join pipe and fittings according to the following:
    - a. Comply with ASTM F 402 for safe-handling practice of cleaners, primers, and solvent cements.
    - b. PVC Nonpressure Piping: ASTM D 2855.
    - c. PVC to ABS Nonpressure Transition Fittings: Procedure and solvent cement according to ASTM D 3138.
  9. Plastic Piping Heat-Fusion Joints: Clean and dry joining surfaces by wiping with clean cloth or paper towels. Join according to ASTM D 2657 procedures and manufacturer's written instructions.
    - a. Plain-End Pipe and Fittings: Use butt fusion.
    - b. Plain-End Pipe and Socket Fittings: Use socket fusion.
- W. Piping Connections: Make connections according to the following, unless otherwise indicated:

1. Install unions, in piping 2-inch NPS and smaller, adjacent to each valve and at final connection to each piece of equipment with 2-inch NPS or smaller threaded pipe connection.
2. Install flanges, in piping 2-1/2-inch NPS and larger, adjacent to flanged valves and at final connection to each piece of equipment with flanged pipe connection.
3. Dry Piping Systems: Install dielectric unions and flanges to connect piping materials of dissimilar metals.
4. Wet Piping Systems: Install dielectric coupling and nipple fittings to connect piping materials of dissimilar metals.

### **3.2 EQUIPMENT AND MATERIAL INSTALLATION - COMMON REQUIREMENTS**

- A. Install equipment and material to provide maximum possible headroom, if mounting heights are not indicated.
- B. Install equipment according to approved submittal data. Portions of the Work are shown only in diagrammatic form. Refer conflicts to Architect.
- C. Install equipment level and plumb, parallel and perpendicular to other building systems and components in exposed interior spaces, unless otherwise indicated.
- D. Install mechanical equipment to facilitate service, maintenance, and repair or replacement of components. Connect equipment for ease of disconnecting, with minimum interference to other installations. Extend grease fittings to accessible locations.
- E. Install equipment and ductwork giving right of way to piping installed at required slope.
- F. Install flexible connectors on equipment side of shutoff valves, horizontally and parallel to equipment shafts if possible.

### **3.3 PAINTING AND FINISHING**

- A. Refer to Division 9 for paint materials, surface preparation, and application of paint.
- B. Do not paint piping specialties with factory-applied finish.
- C. Damage and Touchup: Repair marred and damaged factory-painted finishes with materials and procedures to match original factory finish.

### **3.4 CONCRETE BASES**

- A. Construct concrete bases of dimensions indicated, but not less than 4 inches larger in both directions than supported unit. Follow supported equipment manufacturer's setting templates for anchor bolt and tie locations. Use 3000-psi, 28-day compressive-strength concrete and reinforcement or as specified in Division 3.

### **3.5 ERECTION OF METAL SUPPORTS AND ANCHORAGE**

- A. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor mechanical materials and equipment.
- B. Field Welding: Comply with AWS D1.1, "Structural Welding Code--Steel."

### **3.6 CUTTING AND PATCHING**

- A. Cut, channel, chase, and drill floors, walls, partitions, ceilings, and other surfaces necessary for mechanical installations. Perform cutting by skilled mechanics of trades involved.
- B. Repair cut surfaces to match adjacent surfaces.

### **3.7 GROUTING**

- A. Install nonmetallic, nonshrink, grout for mechanical equipment base bearing surfaces, pump and other equipment base plates, and anchors. Mix grout according to manufacturer's written instructions.
- B. Clean surfaces that will come into contact with grout.
- C. Provide forms as required for placement of grout.
- D. Avoid air entrapment during placing of grout.
- E. Place grout, completely filling equipment bases.
- F. Place grout on concrete bases to provide smooth bearing surface for equipment.
- G. Place grout around anchors.
- H. Cure placed grout according to manufacturer's written instructions.

**END OF SECTION**



**DIVISION 15060**  
**HANGERS AND SUPPORTS**

**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 hangers and supports for mechanical system piping and equipment.
- B. Related Sections include the following:
  - 1. Division 5 Sections for materials for attaching hangers and supports to building structure.
  - 2. Division 13 Sections on fire-suppression piping for fire-suppression pipe hangers.
  - 3. Division 15 Section "Mechanical Vibration Controls and Seismic Restraints" for vibration isolation and seismic restraint devices.

**1.3 DEFINITIONS**

- A. MSS: Manufacturers Standardization Society for the Valve and Fittings Industry.
- B. Terminology: As defined in MSS SP-90, "Guidelines on Terminology for Pipe Hangers and Supports."

**1.4 PERFORMANCE REQUIREMENTS**

- A. Design channel support systems for piping to support multiple pipes capable of supporting combined weight of supported systems, system contents, and test water.
- B. Design heavy-duty steel trapezes for piping to support multiple pipes capable of supporting combined weight of supported systems, system contents, and test water.

**1.5 SUBMITTALS**

- A. Product Data: For each type of pipe hanger, channel support system component, and thermal-hanger shield insert indicated.

- B. Shop Drawings: Signed and sealed by a qualified professional engineer for multiple piping supports and trapeze hangers. Include design calculations and indicate size and characteristics of components and fabrication details.

## 1.6 QUALITY ASSURANCE

- A. Engineering Responsibility: Design and preparation of Shop Drawings and calculations for each multiple pipe support and trapeze by a qualified professional engineer.
  - 1. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of hangers and supports that are similar to those indicated for this Project in material, design, and extent.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Pipe Hangers:
    - a. Globe Pipe Hanger Products, Inc.
    - b. Grinnell Corp.
    - c. Michigan Hanger Co., Inc.

### 2.2 MANUFACTURED UNITS

- A. Pipe Hangers, Supports, and Components: MSS SP-58, factory-fabricated components. Refer to "Hanger and Support Applications" Article in Part 3 for where to use specific hanger and support types.
  - 1. Galvanized, Metallic Coatings: For piping and equipment that will not have field-applied finish.
  - 2. Nonmetallic Coatings: On attachments for electrolytic protection where attachments are in direct contact with copper tubing.
- B. Channel Support Systems: MFMA-2, factory-fabricated components for field assembly.
  - 1. Coatings: Manufacturer's standard finish, unless bare metal surfaces are indicated.  
Nonmetallic Coatings: On attachments for electrolytic protection where attachments are in direct contact with copper tubing.

## **2.3 MISCELLANEOUS MATERIALS**

- A. Mechanical-Anchor Fasteners: Insert-type attachments with pull-out and shear capacities appropriate for supported loads and building materials where used.
- B. Structural Steel: ASTM A 36/A 36M, steel plates, shapes, and bars, black and galvanized.

## **PART 3 - EXECUTION**

### **3.1 HANGER AND SUPPORT APPLICATIONS**

- A. Specific hanger requirements are specified in Sections specifying equipment and systems.
- B. Comply with MSS SP-69 for pipe hanger selections and applications that are not specified in piping system Specification Sections.
- C. Horizontal-Piping Hangers and Supports: Unless otherwise indicated and except as specified in piping system Specification Sections, install the following types:
  - 1. Adjustable Steel Clevis Hangers (MSS Type 1): For suspension of noninsulated or insulated stationary pipes, NPS 1/2 to NPS 30.
  - 2. Adjustable Swivel-Ring Band Hangers (MSS Type 10): For suspension of noninsulated stationary pipes, NPS 1/2 to NPS 2.
  - 3. Extension Hinged Clamps (MSS Type 12): For suspension of noninsulated stationary pipes, NPS 3/8 to NPS 3.
- D. Vertical-Piping Clamps: Unless otherwise indicated and except as specified in piping system Specification Sections, install the following types:
  - 1. Extension Pipe or Riser Clamps (MSS Type 8): For support of pipe risers, NPS 3/4 to NPS 20.
- E. Hanger-Rod Attachments: Unless otherwise indicated and except as specified in piping system Specification Sections, install the following types:
  - 1. Steel Turnbuckles (MSS Type 13): For adjustment up to 6 inches for heavy loads.
  - 2. Swivel Turnbuckles (MSS Type 15): For use with MSS Type 11, split pipe rings.
  - 3. Malleable-Iron Sockets (MSS Type 16): For attaching hanger rods to various types of building attachments.
  - 4. Steel Weldless Eye Nuts (MSS Type 17): For 120 to 450 deg F piping installations.
- F. Building Attachments: Unless otherwise indicated and except as specified in piping system Specification Sections, install the following types:

1. Top-Beam C-Clamps (MSS Type 19): For use under roof installations with bar-joint construction to attach to top flange of structural shape.
  2. Side-Beam or Channel Clamps (MSS Type 20): For attaching to bottom flange of beams, channels, or angles.
  3. Center-Beam Clamps (MSS Type 21): For attaching to center of bottom flange of beams.
  4. C-Clamps (MSS Type 23): For structural shapes.
  5. Top-Beam Clamps (MSS Type 25): For top of beams if hanger rod is required tangent to flange edge.
  6. Steel-Beam Clamps with Eye Nuts (MSS Type 28): For attaching to bottom of steel I-beams for heavy loads.
  7. Linked-Steel Clamps with Eye Nuts (MSS Type 29): For attaching to bottom of steel I-beams for heavy loads, with link extensions.
  8. Malleable Beam Clamps with Extension Pieces (MSS Type 30): For attaching to structural steel.
- G. Saddles and Shields: Unless otherwise indicated and except as specified in piping system Specification Sections, install the following types:
1. Steel Pipe-Covering Protection Saddles (MSS Type 39): To fill interior voids with insulation that matches adjoining insulation.
  2. Protection Shields (MSS Type 40): Of length recommended by manufacturer to prevent crushing insulation.
- H. Spring Hangers and Supports: Unless otherwise indicated and except as specified in piping system Specification sections, install the following types:
1. Restraint-Control Devices (MSS Type 47): Where indicated to control piping movement.
  2. Spring Cushions (MSS Type 48): For light loads if vertical movement does not exceed 1-1/4 inches (32 mm).

### **3.2 HANGER AND SUPPORT INSTALLATION**

- A. Pipe Hanger and Support Installation: Comply with MSS SP-69 and MSS SP-89. Install hangers, supports, clamps, and attachments as required to properly support piping from building structure.
- B. Channel Support System Installation: Arrange for grouping of parallel runs of piping and support together on field-assembled channel systems.
1. Field assemble and install according to manufacturer's written instructions.
- C. Heavy-Duty Steel Trapeze Installation: Arrange for grouping of parallel runs of horizontal piping and support together on field-fabricated, heavy-duty trapezes.
1. Pipes of Various Sizes: Support together and space trapezes for smallest pipe size or install intermediate supports for smaller diameter pipes as specified above for individual pipe hangers.

2. Field fabricate from ASTM A 36/A 36M, steel shapes selected for loads being supported. Weld steel according to AWS D-1.1.
- D. Install building attachments within concrete slabs or attach to structural steel. Space attachments within maximum piping span length indicated in MSS SP-69. Install additional attachments at concentrated loads, including valves, flanges, guides, strainers, and expansion joints, and at changes in direction of piping. Install concrete inserts before concrete is placed; fasten inserts to forms and install reinforcing bars through openings at top of inserts.
  - E. Install hangers and supports complete with necessary inserts, bolts, rods, nuts, washers, and other accessories.
  - F. Install hangers and supports to allow controlled thermal and seismic movement of piping systems, to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends, and similar units.
  - G. Load Distribution: Install hangers and supports so that piping live and dead loads and stresses from movement will not be transmitted to connected equipment.
  - H. Pipe Slopes: Install hangers and supports to provide indicated pipe slopes and so maximum pipe deflections allowed by ASME B31.9, "Building Services Piping," is not exceeded.
  - I. Insulated Piping: Comply with the following:
    1. Attach clamps and spacers to piping.
      - a. Piping Operating above Ambient Air Temperature: Clamp may project through insulation.
      - b. Piping Operating below Ambient Air Temperature: Use thermal-hanger shield insert with clamp sized to match OD of insert.
      - c. Do not exceed pipe stress limits according to ASME B31.9.
    2. Shield Dimensions for Pipe: Not less than the following:
      - a. NPS 1/4 to NPS 3-1/2: 12 inches long and 0.048 inch thick.
      - b. NPS 4: 12 inches long and 0.06 inch thick.
      - c. NPS 5 and NPS 6: 18 inches long and 0.06 inch thick.
      - d. NPS 8 to NPS 14: 24 inches long and 0.075 inch thick.
      - e. NPS 16 to NPS 24: 24 inches long and 0.105 inch thick.
    5. Pipes NPS 8 and Larger: Include wood inserts.
    6. Insert Material: Length at least as long as protective shield.

### **3.3 EQUIPMENT SUPPORTS**

- A. Fabricate structural-steel stands to suspend equipment from structure above or to support equipment above floor.
- B. Grouting: Place grout under supports for equipment and make smooth bearing surface.

### **3.4 ADJUSTING**

- A. Hanger Adjustment: Adjust hangers to distribute loads equally on attachments and to achieve indicated slope of pipe.

**END OF SECTION**

**DIVISION 15075**  
**MECHANICAL IDENTIFICATION**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. This Section includes the following mechanical identification materials and their installation:
  - 1. Equipment nameplates.
  - 2. Equipment markers.
  - 3. Access panel and door markers.
  - 4. Pipe markers.
  - 5. Duct markers.
  - 6. Valve tags.

**1.3 SUBMITTALS**

- A. Product Data: For each type of product indicated.

**1.4 COORDINATION**

- A. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.
- B. Coordinate installation of identifying devices with location of access panels and doors.
- C. Install identifying devices before installing acoustical ceilings and similar concealment.

**PART 2 - PRODUCTS**

**2.1 EQUIPMENT IDENTIFICATION DEVICES**

- A. Equipment Nameplates: Metal, with data engraved or stamped, for permanent attachment on equipment.
  - 1. Data:

- a. Manufacturer, product name, model number, and serial number.
    - b. Capacity, operating and power characteristics, and essential data.
    - c. Labels of tested compliances.
  - 2. Location: Accessible and visible.
  - 3. Fasteners: As required to mount on equipment.
- B. Equipment Markers: Engraved, color-coded laminated plastic. Include contact-type, permanent adhesive.
- 1. Terminology: Match schedules as closely as possible.
  - 2. Data:
    - a. Name and plan number.
    - b. Equipment service.
    - c. Design capacity.
    - d. Other design parameters such as pressure drop, entering and leaving conditions, and speed.
  - 3. Size: 2-1/2 by 4 inches (64 by 100 mm) for control devices, dampers, and valves; 4-1/2 by 6 inches (115 by 150 mm) for equipment.
  - 4. Fasteners: Self-tapping, stainless-steel screws or contact-type, permanent adhesive.

## 2.2 PIPING IDENTIFICATION DEVICES

- A. Manufactured Pipe Markers, General: Preprinted, color-coded, with lettering indicating service, and showing direction of flow.
- 1. Colors: Comply with ASME A13.1, unless otherwise indicated.
  - 2. Lettering: Use piping system terms indicated and abbreviate only as necessary for each application length.
  - 3. Pipes with OD, Including Insulation, Less Than 6 Inches (150 mm): Full-band pipe markers extending 360 degrees around pipe at each location.
  - 4. Pipes with OD, Including Insulation, 6 Inches (150 mm) and Larger: Either full-band or strip-type pipe markers at least three times letter height and of length required for label.
  - 5. Arrows: Integral with piping system service lettering to accommodate both directions; or as separate unit on each pipe marker to indicate direction of flow.
- B. Pretensioned Pipe Markers: Precoiled semirigid plastic formed to cover full circumference of pipe and to attach to pipe without adhesive.
- C. Shaped Pipe Markers: Preformed semirigid plastic formed to partially cover circumference of pipe and to attach to pipe with mechanical fasteners that do not penetrate insulation vapor barrier.
- D. Self-Adhesive Pipe Markers: Plastic with pressure-sensitive, permanent-type, self-adhesive back.



- E. Plastic Tape: Continuously printed, vinyl tape at least 3 mils (0.08 mm) thick with pressure-sensitive, permanent-type, self-adhesive back.
  - 1. Width for Markers on Pipes with OD, Including Insulation, Less Than 6 Inches (150 mm): 3/4 inch (19 mm) minimum.
  - 2. Width for Markers on Pipes with OD, Including Insulation, 6 Inches (150 mm) or Larger: 1-1/2 inches (38 mm) minimum.

### **2.3 DUCT IDENTIFICATION DEVICES**

- A. Duct Markers: Engraved, color-coded laminated plastic. Include direction and quantity of airflow and duct service (such as supply, return, and exhaust). Include contact-type, permanent adhesive.

### **2.4 VALVE TAGS**

- A. Valve Tags: Stamped or engraved with 1/4-inch (6.4-mm) letters for piping system abbreviation and 1/2-inch (13-mm) numbers, with numbering scheme [approved by Architect] <Insert other>. Provide 5/32-inch (4-mm) hole for fastener.
  - 1. Material: 3/32-inch- (2.4-mm-) thick laminated plastic with 2 black surfaces and white inner layer.
  - 2. Valve-Tag Fasteners: Brass wire-link or beaded chain; or S-hook.

## **PART 3 - EXECUTION**

### **3.1 APPLICATIONS, GENERAL**

- A. Products specified are for applications referenced in other Division 15 Sections. If more than single-type material, device, or label is specified for listed applications, selection is Installer's option.

### **3.2 EQUIPMENT IDENTIFICATION**

- A. Install and permanently fasten equipment nameplates on each major item of mechanical equipment that does not have nameplate or has nameplate that is damaged or located where not easily visible. Locate nameplates where accessible and visible. Include nameplates for the following general categories of equipment:
  - 1. Pumps, compressors, chillers, condensers, and similar motor-driven units.
  - 2. Heat exchangers, coils, evaporators, and similar equipment.
  - 3. Fans, blowers, primary balancing dampers, and mixing boxes.
  - 4. Packaged HVAC central-station and zone-type units.
- B. Install equipment markers with permanent adhesive on or near each major item of mechanical equipment. Data required for markers may be included on signs, and markers may be omitted if both are indicated.

1. Letter Size: Minimum 1/4 inch (6.4 mm) for name of units if viewing distance is less than 24 inches (600 mm), 1/2 inch (13 mm) for viewing distances up to 72 inches (1830 mm), and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.
  2. Data: Distinguish among multiple units, indicate operational requirements, indicate safety and emergency precautions, warn of hazards and improper operations, and identify units.
  3. Locate markers where accessible and visible. Include markers for the following general categories of equipment:
    - a. Main control and operating valves, including safety devices and hazardous units such as gas outlets.
    - b. Fire department hose valves and hose stations.
    - c. Meters, gages, thermometers, and similar units.
    - d. Pumps, compressors, chillers, condensers, and similar motor-driven units.
    - e. Heat exchangers, coils, evaporators, and similar equipment.
    - f. Fans, blowers, primary balancing dampers, and mixing boxes.
    - g. Packaged HVAC central-station and zone-type units.
    - h. Strainers, filters, humidifiers, water-treatment systems, and similar equipment.
- C. Install equipment signs with screws or permanent adhesive on or near each major item of mechanical equipment. Locate signs where accessible and visible.
1. Identify mechanical equipment with equipment markers in the following color codes:
    - a. Green: For cooling equipment and components.
    - b. Yellow: For heating equipment and components.
    - c. Orange: For combination cooling and heating equipment and components.
  2. Letter Size: Minimum 1/4 inch (6.4 mm) for name of units if viewing distance is less than 24 inches (600 mm), 1/2 inch (13 mm) for viewing distances up to 72 inches (1830 mm), and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.
  3. Data: Distinguish among multiple units, indicate operational requirements, indicate safety and emergency precautions, warn of hazards and improper operations, and identify units.
  4. Include signs for the following general categories of equipment:
    - a. Main control and operating valves, including safety devices.
    - b. Pumps, compressors, chillers, condensers, and similar motor-driven units.
    - c. Heat exchangers, coils, evaporators, and similar equipment.
    - d. Fans, blowers, primary balancing dampers, and mixing boxes.
    - e. Packaged HVAC central-station and zone-type units.
    - f. Tanks and pressure vessels.
    - g. Strainers, filters, humidifiers, water-treatment systems, and similar equipment.

- D. Install access panel markers with screws on equipment access panels.

### **3.3 PIPING IDENTIFICATION**

- A. Install manufactured pipe markers indicating service on each piping system. Install with flow indication arrows showing direction of flow.
  - 1. Pipes with OD, Including Insulation, Less Than 6 Inches (150 mm): Pretensioned pipe markers. Use size to ensure a tight fit.
  - 2. Pipes with OD, Including Insulation, 6 Inches (150 mm) and Larger: Self-adhesive pipe markers. Use color-coded, self-adhesive plastic tape, at least 1-1/2 inches (38 mm) wide, lapped at least 3 inches (75 mm) at both ends of pipe marker, and covering full circumference of pipe.
- B. Locate pipe markers and color bands where piping is exposed in finished spaces; machine rooms; accessible maintenance spaces such as shafts, tunnels, and plenums; and exterior nonconcealed locations as follows:
  - 1. Near each valve and control device.
  - 2. Near each branch connection, excluding short takeoffs for fixtures and terminal units. Where flow pattern is not obvious, mark each pipe at branch.
  - 3. Near penetrations through walls, floors, ceilings, and nonaccessible enclosures.
  - 4. At access doors, manholes, and similar access points that permit view of concealed piping.
  - 5. Near major equipment items and other points of origination and termination.
  - 6. Spaced at maximum intervals of 50 feet (15 m) along each run. Reduce intervals to 25 feet (7.6 m) in areas of congested piping and equipment.
  - 7. On piping above removable acoustical ceilings. Omit intermediately spaced markers.

### **3.4 DUCT IDENTIFICATION**

- A. Install duct markers with permanent adhesive on air ducts in the following color codes:
  - 1. Green: For cold-air supply ducts.
  - 2. Blue: For exhaust-, outside-, relief-, return-, and mixed-air ducts.
  - 3. ASME A13.1 Colors and Designs: For hazardous material exhaust.
  - 4. Letter Size: Minimum 1/4 inch (6.4 mm) for name of units if viewing distance is less than 24 inches (600 mm), 1/2 inch (13 mm) for viewing distances up to 72 inches (1830 mm), and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.
- B. Locate markers near points where ducts enter into concealed spaces and at maximum intervals of 50 feet (15 m) in each space where ducts are exposed or concealed by removable ceiling system.

### **3.5 VALVE-TAG INSTALLATION**

- A. Install tags on valves and control devices in piping systems, except check valves; valves within factory-fabricated equipment units; plumbing fixture supply stops; shutoff valves; faucets; convenience and lawn-watering hose connections; and HVAC terminal devices and similar roughing-in connections of end-use fixtures and units. List tagged valves in a valve schedule.
- B. Valve-Tag Application Schedule: Tag valves according to size, shape, and color scheme and with captions similar to those indicated in the following:
  - 1. Valve-Tag Size and Shape:
    - a. Cold Water: 1-1/2 inches (38 mm), round.
    - b. Hot Water: 1-1/2 inches (38 mm), round.
    - c. Fire Protection: 2 inches (50 mm), round.
  - 2. Valve-Tag Color:
    - a. Cold Water: Green.
    - b. Hot Water: Yellow.
    - c. Fire Protection: Red.
  - 3. Letter Color:
    - a. Cold Water: White.
    - b. Hot Water: White.
    - c. Fire Protection: White.

### **3.6 VALVE-SCHEDULE INSTALLATION**

- A. Mount valve schedule on wall in accessible location in each major equipment room.

### **3.7 ADJUSTING**

- A. Relocate mechanical identification materials and devices that have become visually blocked by other work.

### **CLEANING**

- B. Clean faces of mechanical identification devices and glass frames of valve schedules.

**END OF SECTION**

**DIVISION 15081**  
**DUCT INSULATION**

**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 semirigid and flexible duct, plenum, and breeching insulation; insulating cements; field-applied jackets; accessories and attachments; and sealing compounds.
- B. Related Sections include the following:
  - 1. Division 7 Sections for firestopping materials and requirements for penetrations through fire and smoke barriers.
  - 2. Division 15 Section "Pipe Insulation" for insulation for piping systems.
  - 3. Division 15 Section "Metal Ducts" for duct liner.

**1.3 SUBMITTALS**

- A. Product Data: Identify thermal conductivity, thickness, and jackets (both factory and field applied, if any), for each type of product indicated.

**1.4 QUALITY ASSURANCE**

- A. Fire-Test-Response Characteristics: As determined by testing materials identical to those specified in this Section according to ASTM E 84, by a testing and inspecting agency acceptable to authorities having jurisdiction. Factory label insulation and jacket materials and sealer and cement material containers with appropriate markings of applicable testing and inspecting agency.
  - 1. Insulation Installed Indoors: Flame-spread rating of 25 or less, and smoke-developed rating of 50 or less.
  - 2. Insulation Installed Outdoors: Flame-spread rating of 75 or less, and smoke-developed rating of 150 or less.

**1.5 DELIVERY, STORAGE, AND HANDLING**

- A. Packaging: Ship insulation materials in containers marked by manufacturer with appropriate ASTM specification designation, type and grade, and maximum use temperature.
- B. Deliver and store all insulation with protective material until installation. Any material left exposed to moisture and/or particulates shall be removed and replaced.
- C. Any installed insulation left temporarily incomplete shall be covered with protective material until final connections can be installed.

## **1.6 COORDINATION**

- A. Coordinate clearance requirements with duct Installer for insulation application.

## **1.7 SCHEDULING**

- A. Schedule insulation application after testing duct systems. Insulation application may begin on segments of ducts that have satisfactory test results.

## **PART 2 - PRODUCTS**

### **2.1 MANUFACTURERS**

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Mineral-Fiber Insulation:
    - a. CertainTeed Manson.
    - b. Knauf FiberGlass GmbH.
    - c. Owens-Corning Fiberglas Corp.

### **2.2 INSULATION MATERIALS**

- A. Mineral-Fiber Blanket Thermal Insulation: Glass fibers bonded with a thermosetting resin. Comply with ASTM C 553, Type II, with all-service jacket manufactured from kraft paper, reinforcing scrim, aluminum foil, and vinyl film.

### **2.3 ACCESSORIES AND ATTACHMENTS**

- A. Glass Cloth and Tape: Comply with MIL-C-20079H, Type I for cloth and Type II for tape. Woven glass-fiber fabrics, plain weave, presized a minimum of 8 oz./sq. yd. (270 g/sq. m).
  - 1. Tape Width: 4 inches (100 mm).

- B. Adhesive-Attached Anchor Pins and Speed Washers: Galvanized steel plate, pin, and washer manufactured for attachment to duct and plenum with adhesive. Pin length sufficient for insulation thickness indicated.
  - 1. Adhesive: Recommended by the anchor pin manufacturer as appropriate for surface temperatures of ducts, plenums, and breechings; and to achieve a holding capacity of 100 lb (45 kg) for direct pull perpendicular to the adhered surface.

## **2.4 VAPOR RETARDERS**

- A. Mastics: Materials recommended by insulation material manufacturer that are compatible with insulation materials, jackets, and substrates.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Examine substrates and conditions for compliance with requirements for installation and other conditions affecting performance of insulation application.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.2 PREPARATION**

- A. Surface Preparation: Clean and dry surfaces to receive insulation. Remove materials that will adversely affect insulation application.

### **3.3 GENERAL APPLICATION REQUIREMENTS**

- A. Apply insulation materials, accessories, and finishes according to the manufacturer's written instructions; with smooth, straight, and even surfaces; and free of voids throughout the length of ducts and fittings.
- B. Refer to schedules at the end of this Section for materials, forms, jackets, and thicknesses required for each duct system.
- C. Use accessories compatible with insulation materials and suitable for the service. Use accessories that do not corrode, soften, or otherwise attack insulation or jacket in either wet or dry state.
- D. Apply multiple layers of insulation with longitudinal and end seams staggered.
- E. Seal joints and seams with vapor-retarder mastic on insulation indicated to receive a vapor retarder.
- F. Keep insulation materials dry during application and finishing.

- G. Apply insulation with tight longitudinal seams and end joints. Bond seams and joints with adhesive recommended by the insulation material manufacturer.
- H. Apply insulation with the least number of joints practical.
- I. Apply insulation over fittings and specialties, with continuous thermal and vapor-retarder integrity, unless otherwise indicated.
- J. Hangers and Anchors: Where vapor retarder is indicated, seal penetrations in insulation at hangers, supports, anchors, and other projections with vapor-retarder mastic. Apply insulation continuously through hangers and around anchor attachments.
- K. Insulation Terminations: For insulation application where vapor retarders are indicated, seal ends with a compound recommended by the insulation material manufacturer to maintain vapor retarder.
- L. Apply insulation with integral jackets as follows:
  - 1. Pull jacket tight and smooth.
  - 2. Joints and Seams: Cover with tape and vapor retarder as recommended by insulation material manufacturer to maintain vapor seal.
  - 3. Vapor-Retarder Mastics: Where vapor retarders are indicated, apply mastic on seams and joints and at ends adjacent to duct flanges and fittings.
- M. Cut insulation according to manufacturer's written instructions to prevent compressing insulation to less than 75 percent of its nominal thickness.
- N. Install vapor-retarder mastic on ducts and plenums scheduled to receive vapor retarders.
  - 1. Ducts with Vapor Retarders: Overlap insulation facing at seams and seal with vapor-retarder mastic and pressure-sensitive tape having same facing as insulation. Repair punctures, tears, and penetrations with tape or mastic to maintain vapor-retarder seal.
  - 2. Ducts without Vapor Retarders: Overlap insulation facing at seams and secure with outward clinching staples and pressure-sensitive tape having same facing as insulation.
- O. Roof Penetrations: Apply insulation for interior applications to a point even with top of roof flashing.
  - 1. Seal penetrations with vapor-retarder mastic.
  - 2. Apply insulation for exterior applications tightly joined to interior insulation ends.
  - 3. Seal insulation to roof flashing with vapor-retarder mastic.
- P. Interior Wall and Partition Penetrations: Apply insulation continuously through walls and partitions, except fire-rated walls and partitions.
- Q. Fire-Rated Wall and Partition Penetrations: Terminate insulation at fire/smoke damper sleeves for fire-rated wall and partition penetrations.



- R. Floor Penetrations: Terminate insulation at underside of floor assembly and at floor support at top of floor.
1. For insulation indicated to have vapor retarders, taper termination and seal insulation ends with vapor-retarder mastic.

### 3.4 MINERAL-FIBER INSULATION APPLICATION

- A. Blanket Applications for Ducts and Plenums: Secure blanket insulation with adhesive and anchor pins and speed washers.
1. Apply adhesives according to manufacturer's recommended coverage rates per square foot, for 100 percent coverage of duct and plenum surfaces.
  2. Install anchor pins and speed washers on sides and bottom of horizontal ducts and all sides of vertical ducts as follows:
    - a. On duct sides with dimensions 18 inches (450 mm) and smaller, along longitudinal centerline of duct. Space 3 inches (75 mm) maximum from insulation end joints, and 16 inches (400 mm) o.c.
    - b. On duct sides with dimensions larger than 18 inches (450 mm). Space 16 inches (400 mm) o.c. each way, and 3 inches (75 mm) maximum from insulation joints. Apply additional pins and clips to hold insulation tightly against surface at cross bracing.
    - c. Anchor pins may be omitted from top surface of horizontal, rectangular ducts and plenums.
    - d. Do not overcompress insulation during installation.
  3. Impale insulation over anchors and attach speed washers.
  4. Cut excess portion of pins extending beyond speed washers or bend parallel with insulation surface. Cover exposed pins and washers with tape matching insulation facing.
  5. Create a facing lap for longitudinal seams and end joints with insulation by removing 2 inches (50 mm) from one edge and one end of insulation segment. Secure laps to adjacent insulation segment with 1/2-inch (13-mm) staples, 1 inch (25 mm) o.c., and cover with pressure-sensitive tape having same facing as insulation.
  6. Overlap unfaced blankets a minimum of 2 inches (50 mm) on longitudinal seams and end joints. Secure with steel band at end joints and spaced a maximum of 18 inches (450 mm) o.c.
  7. Apply insulation on rectangular duct elbows and transitions with a full insulation segment for each surface. Apply insulation on round duct elbows with individually mitered gores cut to fit the elbow.
  8. Insulate duct stiffeners, hangers, and flanges that protrude beyond the insulation surface with 6-inch- (150-mm-) wide strips of the same material used to insulate duct. Secure on alternating sides of stiffener, hanger, and flange with anchor pins spaced 6 inches (150 mm) o.c.
  9. Apply vapor-retarder mastic to open joints, breaks, and punctures for insulation indicated to receive vapor retarder.

### **3.5 DUCT SYSTEM APPLICATIONS**

- A. Insulation materials and thicknesses are specified in schedules at the end of this Section.
- B. Materials and thicknesses for systems listed below are specified in schedules at the end of this Section.
- C. Insulate the following plenums and duct systems:
  - 1. Indoor concealed supply-, return-, and outside-air ductwork.
  - 2. Indoor exposed supply-, return-, and outside-air ductwork.
  - 3. Indoor concealed range-hood exhaust ductwork.
  - 4. Indoor concealed dishwasher ductwork.
- D. Items Not Insulated: Unless otherwise indicated, do not apply insulation to the following systems, materials, and equipment:
  - 1. Factory-insulated flexible ducts.
  - 2. Factory-insulated plenums, casings, terminal boxes, and filter boxes and sections.
  - 3. Flexible connectors.
  - 4. Vibration-control devices.
  - 5. Testing agency labels and stamps.
  - 6. Nameplates and data plates.
  - 7. Access panels and doors in air-distribution systems.

### **3.6 INDOOR DUCT AND PLENUM APPLICATION SCHEDULE**

- A. Service: Round and rectangular, supply-air ducts, concealed.
  - 1. Material: Mineral-fiber blanket.
  - 2. Thickness: 2 inches (50 mm).
  - 3. Number of Layers: One.
  - 4. Field-Applied Jacket: None.
  - 5. Vapor Retarder Required: Yes.
- B. Service: Round and rectangular, return-air ducts, concealed.
  - 1. Material: Mineral-fiber blanket.
  - 2. Thickness: 2 inches (50 mm).
  - 3. Number of Layers: One.
  - 4. Field-Applied Jacket: None.
  - 5. Vapor Retarder Required: Yes.
- C. Service: Round and rectangular, outside-air ducts, concealed.
  - 1. Material: Mineral-fiber blanket.
  - 2. Thickness: 2 inches (50 mm).
  - 3. Number of Layers: One.
  - 4. Field-Applied Jacket: None.

5. Vapor Retarder Required: Yes.
- D. Service: Round and rectangular, supply and return-air ducts, exposed.
1. Material: Mineral-fiber blanket.
  2. Thickness: 2 inches (50 mm).
  3. Number of Layers: One.
  4. Field-Applied Jacket: None.
  5. Vapor Retarder Required: Yes.
- E. Service: Rectangular, range-hood exhaust ducts, exposed.
1. Material: Calcium silicate.
  2. Thickness: 1-1/2 inches (38 mm).
  3. Number of Layers: Two.
  4. Field-Applied Jacket: Glass cloth.
  5. Vapor Retarder Required: No.
- F. Service: Rectangular, dishwasher exhaust ducts, concealed.
1. Material: Mineral-fiber blanket.
  2. Thickness: 1-1/2 inches (38 mm).
  3. Number of Layers: One.
  4. Field-Applied Jacket: None.
  5. Vapor Retarder Required: No.

**END OF SECTION**

**DIVISION 15083**  
**PIPE INSULATION**

**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 preformed, rigid and flexible pipe insulation; insulating cements; field-applied jackets; accessories and attachments; and sealing compounds.
- B. Related Sections include the following:
  - 1. Division 2 for loose-fill pipe insulation in underground piping outside the building.
  - 2. Division 7 for firestopping materials and requirements for penetrations through fire and smoke barriers.
  - 3. Division 15 Section "Duct Insulation" for insulation for ducts and plenums.
  - 4. Division 15 Section "Equipment Insulation" for insulation materials and application for pumps, tanks, hydronic specialties, and other equipment.
  - 5. Division 15 Section "Hangers and Supports" for pipe insulation shields and protection saddles.

**1.3 SUBMITTALS**

- A. Product Data: Identify thermal conductivity, thickness, and jackets (both factory and field applied, if any), for each type of product indicated.

**1.4 QUALITY ASSURANCE**

- A. Fire-Test-Response Characteristics: As determined by testing materials identical to those specified in this Section according to ASTM E 84, by a testing and inspecting agency acceptable to authorities having jurisdiction. Factory label insulation and jacket materials and sealer and cement material containers with appropriate markings of applicable testing and inspecting agency.
  - 1. Insulation Installed Indoors: Flame-spread rating of 25 or less, and smoke-developed rating of 50 or less.
  - 2. Insulation Installed Outdoors: Flame-spread rating of 75 or less, and smoke-developed rating of 150 or less.

**1.5 DELIVERY, STORAGE, AND HANDLING**

- A. Packaging: Ship insulation materials in containers marked by manufacturer with appropriate ASTM specification designation, type and grade, and maximum use temperature.

## **1.6 COORDINATION**

- A. Coordinate size and location of supports, hangers, and insulation shields specified in Division 15 Section "Hangers and Supports."
- B. Coordinate clearance requirements with piping Installer for insulation application.
- C. Coordinate installation and testing of steam or electric heat tracing.

## **1.7 SCHEDULING**

- A. Schedule insulation application after testing piping systems and, where required, after installing and testing heat-trace tape. Insulation application may begin on segments of piping that have satisfactory test results.

## **PART 2 - PRODUCTS**

### **2.1 MANUFACTURERS**

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Mineral-Fiber Insulation:
    - a. CertainTeed Manson.
    - b. Knauf FiberGlass GmbH.
    - c. Owens-Corning Fiberglas Corp.
    - d. Schuller International, Inc.
  - 2. Cellular-Glass Insulation:
    - a. RBX Corporation; Insul-Sheet 1800 and Insul-Tube 180.
  - 3. Flexible Elastomeric Thermal Insulation:
    - a. Armstrong World Industries, Inc.
    - b. Rubatex Corp.

### **2.2 INSULATION MATERIALS**

- A. Mineral-Fiber Insulation: Glass fibers bonded with a thermosetting resin complying with the following:
  - 1. Preformed Pipe Insulation: Comply with ASTM C 547, Type 1, with factory-applied, all-purpose, vapor-retarder jacket.

2. Fire-Resistant Adhesive: Comply with MIL-A-3316C in the following classes and grades:
    - a. Class 1, Grade A for bonding glass cloth and tape to unfaced glass-fiber insulation, for sealing edges of glass-fiber insulation, and for bonding lagging cloth to unfaced glass-fiber insulation.
    - b. Class 2, Grade A for bonding glass-fiber insulation to metal surfaces.
  3. Vapor-Retarder Mastics: Fire- and water-resistant, vapor-retarder mastic for indoor applications. Comply with MIL-C-19565C, Type II.
  4. Mineral-Fiber Insulating Cements: Comply with ASTM C 195.
  5. Expanded or Exfoliated Vermiculite Insulating Cements: Comply with ASTM C 196.
  6. Mineral-Fiber, Hydraulic-Setting Insulating and Finishing Cement: Comply with ASTM C 449/C 449M.
- B. Cellular-Glass Insulation: Inorganic, foamed or cellulated glass, annealed, rigid, hermetically sealed cells, incombustible.
1. Preformed Pipe Insulation, without Jacket: Comply with ASTM C 552, Type II, Class 1.
  2. Preformed Pipe Insulation, with Jacket: Comply with ASTM C 552, Type II, Class 2.
- C. Closed-Cell Phenolic-Foam Insulation: Preformed pipe insulation of rigid, expanded, closed-cell structure. Comply with ASTM C 1126, Type III, Grade 1.
- D. Flexible Elastomeric Thermal Insulation used on Refrigerant Piping: Closed-cell, sponge- or expanded-rubber materials. Comply with ASTM C 534, Type I for tubular materials.
1. Adhesive: As recommended by insulation material manufacturer.
  2. Ultraviolet-Protective Coating: As recommended by insulation manufacturer.
- E. Prefabricated Thermal Insulating Fitting Covers: Comply with ASTM C 450 for dimensions used in preforming insulation to cover valves, elbows, tees, and flanges.

### **2.3 FIELD-APPLIED JACKETS**

- A. General: ASTM C 921, Type 1, unless otherwise indicated.
- B. Foil and Paper Jacket: Laminated, glass-fiber-reinforced, flame-retardant kraft paper and aluminum foil.
- C. Standard PVC Fitting Covers: Factory-fabricated fitting covers manufactured from 20-mil- (0.5-mm-) thick, high-impact, ultraviolet-resistant PVC.

1. Shapes: 45- and 90-degree, short- and long-radius elbows, tees, valves, flanges, reducers, end caps, soil-pipe hubs, traps, mechanical joints, and P-trap and supply covers for lavatories for the disabled.
  2. Adhesive: As recommended by insulation material manufacturer.
- D. Aluminum Jacket: Factory cut and rolled to indicated sizes. Comply with ASTM B 209 (ASTM B 209M), 3003 alloy, H-14 temper.
1. Finish and Thickness: Smooth finish, 0.010 inch (0.25 mm) thick.
  2. Moisture Barrier: 1-mil- (0.025-mm-) thick, heat-bonded polyethylene and kraft paper.
  3. Elbows: Preformed, 45- and 90-degree, short- and long-radius elbows; same material, finish, and thickness as jacket.
- E. Underground Direct-Buried Jacket: 125-mil-thick vapor barrier and waterproofing membrane consisting of a rubberized bituminous resin reinforced with a woven-glass fiber or polyester scrim and laminated aluminum foil.
1. Products:
    - a. Pittsburgh Corning Corporation; Pittwrap.
    - b. Polyguard; Insulrap No Torch 125.

## **2.4 ACCESSORIES AND ATTACHMENTS**

- A. Glass Cloth and Tape: Comply with MIL-C-20079H, Type I for cloth and Type II for tape. Woven glass-fiber fabrics, plain weave, presized a minimum of 8 oz./sq. yd. (270 g/sq. m).
1. Tape Width: 4 inches (100 mm).
- B. Bands: 3/4 inch (19 mm) wide, in one of the following materials compatible with jacket:
1. Aluminum: 0.007 inch (0.18 mm) thick.

## **2.5 VAPOR RETARDERS**

- A. Mastics: Materials recommended by insulation material manufacturer that are compatible with insulation materials, jackets, and substrates.

# **PART 3 - EXECUTION**

## **3.1 EXAMINATION**

- A. Examine substrates and conditions for compliance with requirements for installation and other conditions affecting performance of insulation application.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.2 PREPARATION**

- A. Surface Preparation: Clean and dry pipe and fitting surfaces. Remove materials that will adversely affect insulation application.

### **3.3 GENERAL APPLICATION REQUIREMENTS**

- A. Apply insulation materials, accessories, and finishes according to the manufacturer's written instructions; with smooth, straight, and even surfaces; free of voids throughout the length of piping, including fittings, valves, and specialties.
- B. Refer to schedules at the end of this Section for materials, forms, jackets, and thicknesses required for each piping system.
- C. Use accessories compatible with insulation materials and suitable for the service. Use accessories that do not corrode, soften, or otherwise attack insulation or jacket in either wet or dry state.
- D. Apply insulation with longitudinal seams at top and bottom of horizontal pipe runs.
- E. Do not weld brackets, clips, or other attachment devices to piping, fittings, and specialties.
- F. Seal joints and seams with vapor-retarder mastic on insulation indicated to receive a vapor retarder.
- G. Keep insulation materials dry during application and finishing.
- H. Apply insulation with tight longitudinal seams and end joints. Bond seams and joints with adhesive recommended by the insulation material manufacturer.
- I. Apply insulation with the least number of joints practical.
- J. Apply insulation over fittings, valves, and specialties, with continuous thermal and vapor-retarder integrity, unless otherwise indicated. Refer to special instructions for applying insulation over fittings, valves, and specialties.
- K. Hangers and Anchors: Where vapor retarder is indicated, seal penetrations in insulation at hangers, supports, anchors, and other projections with vapor-retarder mastic.
  - 1. Apply insulation continuously through hangers and around anchor attachments. Insulation around hanger or pipe clamp will not be acceptable.
  - 2. For insulation application where vapor retarders are indicated, extend insulation on anchor legs at least 12 inches (300 mm) from point of attachment to pipe and taper insulation ends. Seal tapered ends with a compound recommended by the insulation material manufacturer to maintain vapor retarder.
  - 3. Install insert materials and apply insulation to tightly join the insert. Seal insulation to insulation inserts with adhesive or sealing compound recommended by the insulation material manufacturer.



4. Cover inserts with jacket material matching adjacent pipe insulation. Install shields over jacket, arranged to protect the jacket from tear or puncture by the hanger, support, and shield.
- L. Insulation Terminations: For insulation application where vapor retarders are indicated, taper insulation ends. Seal tapered ends with a compound recommended by the insulation material manufacturer to maintain vapor retarder.
- M. Apply adhesives and mastics at the manufacturer's recommended coverage rate.
- N. Apply insulation with integral jackets as follows:
1. Pull jacket tight and smooth.
  2. Circumferential Joints: Cover with 3-inch- (75-mm-) wide strips, of same material as insulation jacket. Secure strips with adhesive and outward clinching staples along both edges of strip and spaced 4 inches (100 mm) o.c.
  3. Longitudinal Seams: Overlap jacket seams at least 1-1/2 inches (40 mm). Apply insulation with longitudinal seams at bottom of pipe. Clean and dry surface to receive self-sealing lap. Staple laps with outward clinching staples along edge at 4 inches (100 mm) o.c.
    - a. Exception: Do not staple longitudinal laps on insulation having a vapor retarder.
  4. Vapor-Retarder Mastics: Where vapor retarders are indicated, apply mastic on seams and joints and at ends adjacent to flanges, unions, valves, and fittings.
  5. At penetrations in jackets for thermometers and pressure gages, fill and seal voids with vapor-retarder mastic.
- O. Roof Penetrations: Apply insulation for interior applications to a point even with top of roof flashing.
1. Seal penetrations with vapor-retarder mastic.
  2. Apply insulation for exterior applications tightly joined to interior insulation ends.
  3. Extend metal jacket of exterior insulation outside roof flashing at least 2 inches (50 mm) below top of roof flashing.
  4. Seal metal jacket to roof flashing with vapor-retarder mastic.
- P. Exterior Wall Penetrations: For penetrations of below-grade exterior walls, terminate insulation flush with mechanical sleeve seal. Seal terminations with vapor-retarder mastic.
- Q. Interior Wall and Partition Penetrations: Apply insulation continuously through walls and floors.
- R. Fire-Rated Wall and Partition Penetrations: Apply insulation continuously through penetrations of fire-rated walls and partitions.
1. Firestopping and fire-resistive joint sealers are specified in Division 7 Section "Firestopping."

### 3.4 MINERAL-FIBER INSULATION APPLICATION

- A. Apply insulation to straight pipes and tubes as follows:
1. Secure each layer of preformed pipe insulation to pipe with wire, tape, or bands without deforming insulation materials.
  2. Where vapor retarders are indicated, seal longitudinal seams and end joints with vapor-retarder mastic. Apply vapor retarder to ends of insulation at intervals of 15 to 20 feet (4.5 to 6 m) to form a vapor retarder between pipe insulation segments.
  3. For insulation with factory-applied jackets, secure laps with outward clinched staples at 6 inches (150 mm) o.c.
  4. For insulation with factory-applied jackets with vapor retarders, do not staple longitudinal tabs but secure tabs with additional adhesive as recommended by the insulation material manufacturer and seal with vapor-retarder mastic.
- B. Apply insulation to flanges as follows:
1. Apply preformed pipe insulation to outer diameter of pipe flange.
  2. Make width of insulation segment the same as overall width of the flange and bolts, plus twice the thickness of the pipe insulation.
  3. Fill voids between inner circumference of flange insulation and outer circumference of adjacent straight pipe segments with mineral-fiber blanket insulation.
  4. Apply canvas jacket material with manufacturer's recommended adhesive, overlapping seams at least 1 inch (25 mm), and seal joints with vapor-retarder mastic.
- C. Apply insulation to fittings and elbows as follows:
1. Apply premolded insulation sections of the same material as straight segments of pipe insulation when available. Secure according to manufacturer's written instructions.
  2. When premolded insulation elbows and fittings are not available, apply mitered sections of pipe insulation, or glass-fiber blanket insulation, to a thickness equal to adjoining pipe insulation. Secure insulation materials with wire, tape, or bands.
  3. Cover fittings with standard PVC fitting covers.
- D. Apply insulation to valves and specialties as follows:
1. Apply premolded segments of cellular-glass insulation or glass-fiber blanket insulation to valve body. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation. For check valves, arrange insulation for access to strainer basket without disturbing insulation.
  2. Apply insulation to flanges as specified for flange insulation application.
  3. Use preformed standard PVC fitting covers for valve sizes where available. Secure fitting covers with manufacturer's attachments and accessories. Seal seams with tape and vapor-retarder mastic.

4. For larger sizes where PVC fitting covers are not available, seal insulation with canvas jacket and sealing compound recommended by the insulation material manufacturer.

### 3.5 CELLULAR-GLASS INSULATION APPLICATION

- A. Apply insulation to straight pipes and tubes as follows:
  1. Secure each layer of insulation to pipe with wire, tape, or bands without deforming insulation materials.
  2. Where vapor retarders are indicated, seal longitudinal seams and end joints with vapor-retarder mastic.
  3. For insulation with factory-applied jackets, secure laps with outward clinched staples at 6 inches o.c.
  4. For insulation with factory-applied jackets with vapor retarders, do not staple longitudinal tabs but secure with additional adhesive as recommended by the insulation material manufacturer and seal with vapor-retarder mastic.
- B. Apply insulation to flanges as follows:
  1. Apply preformed pipe insulation to outer diameter of pipe flange.
  2. Make width of insulation segment the same as overall width of the flange and bolts, plus twice the thickness of the pipe insulation.
  3. Fill voids between inner circumference of flange insulation and outer circumference of adjacent straight pipe segments with cut sections of cellular-glass block insulation of the same thickness as pipe insulation.
  4. Apply canvas jacket material with manufacturer's recommended adhesive, overlapping seams at least 1 inch (25 mm), and seal joints with vapor-retarder mastic.
- C. Apply insulation to fittings and elbows as follows:
  1. Apply premolded insulation sections of the same material as straight segments of pipe insulation when available. Secure according to manufacturers written instructions.
  2. When premolded sections of insulation are not available, apply mitered sections of cellular-glass insulation. Secure insulation materials with wire, tape, or bands.
  3. Cover fittings with heavy PVC fitting covers. Overlap PVC covers on pipe insulation jackets at least 1 inch (25 mm) at each end. Secure fitting covers with manufacturer's attachments and accessories. Seal seams with tape and vapor-retarder mastic.
- D. Apply insulation to valves and specialties as follows:
  1. Apply premolded segments of cellular-glass insulation or glass-fiber blanket insulation to valve body. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation. For check valves, arrange insulation for access to stainer basket without disturbing insulation.
  2. Apply insulation to flanges as specified for flange insulation application.

3. Use preformed heavy PVC fitting covers for valve sizes where available. Secure fitting covers with manufacturer's attachments and accessories. Seal seams with tape and vapor-retarder mastic.
4. For larger sizes where PVC fitting covers are not available, seal insulation with canvas jacket and sealing compound recommended by the insulation material manufacturer.

### **3.6 CLOSED-CELL PHENOLIC-FOAM INSULATION APPLICATION**

- A. Apply insulation to straight pipes and tubes as follows:
  1. Secure each layer of insulation to pipe with wire, tape, or bands without deforming insulation materials.
  2. Where vapor retarders are indicated, seal longitudinal seams and end joints with vapor-retarder mastic.
  3. For insulation with factory-applied jackets, secure laps with outward clinched staples at 6 inches o.c.
  4. For insulation with factory-applied jackets with vapor retarders, do not staple longitudinal tabs but secure with additional adhesive as recommended by the insulation material manufacturer and seal with vapor-retarder mastic.
- B. Apply insulation to flanges as follows:
  1. Apply preformed pipe insulation to outer diameter of pipe flange.
  2. Make width of insulation segment the same as overall width of the flange and bolts, plus twice the thickness of the pipe insulation.
  3. Fill voids between inner circumference of flange insulation and outer circumference of adjacent straight pipe segments with cut sections of block insulation of the same thickness as pipe insulation.
  4. Apply canvas jacket material with manufacturer's recommended adhesive, overlapping seams at least 1 inch (25 mm), and seal joints with vapor-retarder mastic.
- C. Apply insulation to fittings and elbows as follows:
  1. Apply premolded insulation sections of the same material as straight segments of pipe insulation when available. Secure according to manufacturer's written instructions.
  2. When premolded sections of insulation are not available, apply mitered sections of phenolic-foam insulation. Secure insulation materials with wire, tape, or bands.
  3. Cover fittings with heavy PVC fitting covers. Overlap PVC covers on pipe insulation jackets at least 1 inch (25 mm) at each end. Secure fitting covers with manufacturer's attachments and accessories. Seal seams with tape and vapor-retarder mastic.
- D. Apply insulation to valves and specialties as follows:
  1. Apply premolded insulation sections of the same material as straight segments of pipe insulation when available. Secure according to manufacturer's written instructions.

2. When premolded sections of insulation are not available, apply mitered sections of phenolic-foam insulation to valve body. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation. For check valves, arrange insulation for access to stainer basket without distributing insulation.
3. Apply insulation to flanges as specified for flange insulation application.
4. Use preformed heavy PVC fitting covers for valve sizes where available. Secure fitting covers with manufacturer's attachments and accessories. Seal seams with tape and vapor-retarder mastic.
5. For larger sizes where PVC fitting covers are not available, seal insulation with canvas jacket and sealing compound recommended by the insulation material manufacturer.

### **3.7 FLEXIBLE ELASTOMERIC THERMAL INSULATION APPLICATION**

- A. Apply insulation to straight pipes and tubes as follows:
  1. Follow manufacturer's written instructions for applying insulation.
  2. Seal longitudinal seams and end joints with manufacturer's recommended adhesive. Cement to avoid openings in insulation that will allow passage of air to the pipe surface.
- B. Apply insulation to flanges as follows:
  1. Apply pipe insulation to outer diameter of pipe flange.
  2. Make width of insulation segment the same as overall width of the flange and bolts, plus twice the thickness of the pipe insulation.
  3. Fill voids between inner circumference of flange insulation and outer circumference of adjacent straight pipe segments with cut sections of sheet insulation of the same thickness as pipe insulation.
  4. Secure insulation to flanges and seal seams with manufacturer's recommended adhesive. Cement to avoid openings in insulation that will allow passage of air to the pipe surface.
- C. Apply insulation to fittings and elbows as follows:
  1. Apply mitered sections of pipe insulation.
  2. Secure insulation materials and seal seams with manufacturer's recommended adhesive. Cement to avoid openings in insulation that will allow passage of air to the pipe surface.
- D. Apply insulation to valves and specialties as follows:
  1. Apply preformed valve covers manufactured of the same material as pipe insulation and attached according to the manufacturer's written instructions.
  2. Apply cut segments of pipe and sheet insulation to valve body. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation. For check valves, fabricate removable sections of insulation arranged to allow access to stainer basket.

3. Apply insulation to flanges as specified for flange insulation application.
4. Secure insulation to valves and specialties and seal seams with manufacturer's recommended adhesive. Cement to avoid openings in insulation that will allow passage of air to the pipe surface.

### **3.8 FIELD-APPLIED JACKET APPLICATION**

- A. Apply glass-cloth jacket, where indicated, directly over bare insulation or insulation with factory-applied jackets.
  1. Apply jacket smooth and tight to surface with 2-inch (50-mm) overlap at seams and joints.
  2. Embed glass cloth between two 0.062-inch- (1.6-mm-) thick coats of jacket manufacturer's recommended adhesive.
  3. Completely encapsulate insulation with jacket, leaving no exposed raw insulation.
- B. Foil and Paper Jackets: Apply foil and paper jackets where indicated.
  1. Draw jacket material smooth and tight.
  2. Apply lap or joint strips with the same material as jacket.
  3. Secure jacket to insulation with manufacturer's recommended adhesive.
  4. Apply jackets with 1-1/2-inch (40-mm) laps at longitudinal seams and 3-inch- (75-mm-) wide joint strips at end joints.
  5. Seal openings, punctures, and breaks in vapor-retarder jackets and exposed insulation with vapor-retarder mastic.
- C. Apply metal jacket where indicated, with 2-inch (50-mm) overlap at longitudinal seams and end joints. Overlap longitudinal seams arranged to shed water. Seal end joints with weatherproof sealant recommended by insulation manufacturer. Secure jacket with stainless-steel bands 12 inches (300 mm) o.c. and at end joints.

### **3.9 PIPING SYSTEM APPLICATIONS**

- A. Insulation materials and thicknesses are specified in schedules at the end of this Section.
- B. Items Not Insulated: Unless otherwise indicated, do not apply insulation to the following systems, materials, and equipment:
  1. Flexible connectors.
  2. Fire-suppression piping.
  3. Drainage piping located in crawl spaces, unless otherwise indicated.
  4. Below-grade piping, unless otherwise indicated.
  5. Chrome-plated pipes and fittings, unless potential for personnel injury.
  6. Air chambers, unions, strainers, check valves, plug valves, and flow regulators.

### **3.10 INTERIOR INSULATION APPLICATION SCHEDULE**

- A. Service: Domestic hot and recirculated hot water.
  - 1. Operating Temperature: 60 to 140 deg F (15 to 60 deg C).
  - 2. Insulation Material: Mineral fiber
  - 3. Insulation Thickness: 1" thick
  - 4. Field-Applied Jacket: Foil and Paper(ASJ)
  - 5. Vapor Retarder Required: No
  - 6. Finish: None.
  
- B. Service: Rainwater conductors and roof drain bodies.
  - 1. Operating Temperature: 32 to 100 deg F
  - 2. Insulation Material: Flexible elastomeric.
  - 3. Insulation Thickness: 1" thickness
  - 4. Field-Applied Jacket: Foil and Paper(ASJ)
  - 5. Vapor Retarder Required: Yes.
  - 6. Finish: None.
  
- C. Service: Condensate and equipment drain piping.
  - 1. Operating Temperature: 40 to 60 deg F
  - 2. Insulation Material: Flexible elastomeric, only on first ten feet of pipe from trap.
  - 3. Insulation Thickness: 3/4"
  - 4. Field-Applied Jacket: None.
  - 5. Vapor Retarder Required: No.
  - 6. Finish: Two coats of the insulation manufacturer's recommended protective coating.
  
- D. Service: Refrigerant suction and hot-gas piping.
  - 1. Operating Temperature: 35 to 50 deg F
  - 2. Insulation Material: Flexible elastomeric.
  - 3. Insulation Thickness: 1" thick.
  - 4. Field-Applied Jacket: None.
  - 5. Vapor Retarder Required: Yes.
  - 6. Finish: None.
  
- E. Service: Domestic water piping.
  - 1. Operating Temperature: 60 to 80 deg F
  - 2. Insulation Material: Mineral Fiber
  - 3. Insulation Thickness: 1" thick.
  - 4. Field-Applied Jacket: Foil and Paper(ASJ)
  - 5. Vapor Retarder Required: Yes.
  - 6. Finish: None.
  
- F. Service: For obtaining fire/smoke rating in return air plenum (calbes, PE, PB, PP, ABS, PVC, CPVC, etc).
  - 1. Operating Temperature: 35 to 90 deg F
  - 2. Insulation Material: 3M Fire Barrier Plenum Wrap 5 A or equal.

3. Insulation Thickness: larger of 1" or mfr's recommendations.
4. Field-Applied Jacket: scrim reinforced foil
5. Vapor Retarder Required: None.
6. Finish: None.

### **3.11 EXTERIOR INSULATION APPLICATION SCHEDULE**

#### **A. Service: Domestic water.**

1. Operating Temperature: 60 to 140 deg F (15 to 60 deg C).
2. Insulation Material: Mineral fiber.
3. Insulation Thickness: Apply the following insulation thicknesses: 1"
4. Field-Applied Jacket: Aluminum.
5. Vapor Retarder Required: Yes.
6. Finish: None.

#### **B. Service: Refrigerant suction.**

1. Operating Temperature: 35 to 50 deg F (2 to 10 deg C).
2. Insulation Material: Flexible elastomeric.
3. Insulation Thickness: Apply the following insulation thicknesses: ½"
4. Field-Applied Jacket: Aluminum
5. Vapor Retarder Required: Yes.
6. Finish: None.

**END OF SECTION**



**DIVISION 15110**  
**VALVES**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. This Section includes the following general-duty valves:
1. Copper-alloy ball valves.
  2. Bronze check valves.
  3. Bronze gate valves.
  4. Cast-iron gate valves.
- B. Related Sections include the following:
1. Division 2 piping Sections for general-duty and specialty valves for site construction piping.
  2. Division 13 fire-suppression piping and fire pump Sections for fire-protection valves.
  3. Division 15 Section "Mechanical Identification" for valve tags and charts.
  4. Division 15 piping Sections for specialty valves applicable to those Sections only.

**1.3 DEFINITIONS**

- A. The following are standard abbreviations for valves:
1. CWP: Cold working pressure.
  2. EPDM: Ethylene-propylene-diene terpolymer rubber.
  3. NBR: Acrylonitrile-butadiene rubber.
  4. PTFE: Polytetrafluoroethylene plastic.
  5. SWP: Steam working pressure.
  6. TFE: Tetrafluoroethylene plastic.

**1.4 SUBMITTALS**

- A. Product Data: For each type of valve indicated. Include body, seating, and trim materials; valve design; pressure and temperature classifications; end connections; arrangement; dimensions; and required clearances. Include list indicating valve and its application. Include rated capacities; shipping, installed, and operating weights; furnished specialties; and accessories.

## **1.5 QUALITY ASSURANCE**

- A. ASME Compliance: ASME B31.9 for building services piping valves.
  - 1. Exceptions: , sanitary waste, and storm drainage piping valves unless referenced.
- B. ASME Compliance for Ferrous Valves: ASME B16.10 and ASME B16.34 for dimension and design criteria.
- C. NSF Compliance: NSF 61 for valve materials for potable-water service.

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

- A. Prepare valves for shipping as follows:
  - 1. Protect internal parts against rust and corrosion.
  - 2. Protect threads, flange faces, grooves, and weld ends.
  - 3. Set angle, gate, and globe valves closed to prevent rattling.
  - 4. Set ball and plug valves open to minimize exposure of functional surfaces.
  - 5. Set butterfly valves closed or slightly open.
  - 6. Block check valves in either closed or open position.
- B. Use the following precautions during storage:
  - 1. Maintain valve end protection.
  - 2. Store valves indoors and maintain at higher than ambient dew-point temperature. If outdoor storage is necessary, store valves off the ground in watertight enclosures.
- C. Use sling to handle large valves; rig sling to avoid damage to exposed parts. Do not use handwheels or stems as lifting or rigging points.

## **PART 2 - PRODUCTS**

### **2.1 MANUFACTURERS**

- A. In other Part 2 articles where subparagraph titles below introduce lists, the following requirements apply for product selection:
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Crane Co.; Crane Valve Group; Crane Valves.
    - b. Grinnell Corporation.
    - c. Hammond Valve.
    - d. Milwaukee Valve Company.
    - e. NIBCO INC.
    - f. Red-White Valve Corp.
    - g. Watts Industries, Inc.; Water Products Div.

## **2.2 VALVES, GENERAL**

- A. Refer to Part 3 "Valve Applications" Article for applications of valves.
- B. Bronze Valves: NPS 2 (DN 50) and smaller with threaded ends, unless otherwise indicated.
- C. Ferrous Valves: NPS 2-1/2 (DN 65) and larger with flanged ends, unless otherwise indicated.
- D. Valve Pressure and Temperature Ratings: Not less than indicated and as required for system pressures and temperatures.
- E. Valve Sizes: Same as upstream pipe, unless otherwise indicated.
- F. Valve Actuators:
  - 1. Handwheel: For valves other than quarter-turn types.
  - 2. Lever Handle: For quarter-turn valves NPS 6 (DN 150) and smaller, except plug valves.
- G. Extended Valve Stems: On insulated valves.
- H. Valve Flanges: ASME B16.1 for cast-iron valves, ASME B16.5 for steel valves, and ASME B16.24 for bronze valves.
- I. Valve Grooved Ends: AWWA C606.
  - 1. Solder Joint: With sockets according to ASME B16.18.
    - a. Caution: Use solder with melting point below 840 deg F (454 deg C) for angle, check, gate, and globe valves; below 421 deg F (216 deg C) for ball valves.
  - 2. Threaded: With threads according to ASME B1.20.1.
- J. Valve Bypass and Drain Connections: MSS SP-45.

## **2.3 COPPER-ALLOY BALL VALVES**

- A. Copper-Alloy Ball Valves, General: MSS SP-110.
- B. One-Piece, Copper-Alloy Ball Valves: Brass or bronze body with chrome-plated bronze ball, PTFE or TFE seats, and 400-psig (2760-kPa) minimum] [600-psig (4140-kPa)] CWP rating.
- C. Two-Piece, Copper-Alloy Ball Valves: Brass or bronze body with full-port, chrome-plated bronze ball; PTFE seats; and 600-psig (4140-kPa) minimum CWP rating and blowout-proof stem.

## **2.4 BRONZE CHECK VALVES**

- A. Bronze Check Valves, General: MSS SP-80.
- B. Type 1, Class 150, Bronze, Horizontal Lift Check Valves: Bronze body with bronze disc and seat.
- C. Type 1, Class 150, Bronze, Vertical Lift Check Valves: Bronze body with bronze disc and seat.

## **2.5 BRONZE GATE VALVES**

- A. Bronze Gate Valves, General: MSS SP-80, with ferrous-alloy handwheel.
- B. Type 1, Class 125, Bronze Gate Valves: Bronze body with nonrising stem and bronze solid wedge and union-ring bonnet.

## **2.6 CAST-IRON GATE VALVES**

- A. Cast-Iron Gate Valves, General: MSS SP-70, Type I.
- B. Class 125, NRS, Bronze-Mounted, Cast-Iron Gate Valves: Cast-iron body with bronze trim, nonrising stem, and solid-wedge disc.
- C. Class 125, OS&Y, Bronze-Mounted, Cast-Iron Gate Valves: Cast-iron body with bronze trim, rising stem, and solid-wedge disc.

## **2.7 CAST-IRON PLUG VALVES**

- A. Cast-Iron Plug Valves, General: MSS SP-78.
- B. Class 125 or 150, lubricated-type, cast-iron plug valves.

# **PART 3 - EXECUTION**

## **3.1 EXAMINATION**

- A. Examine piping system for compliance with requirements for installation tolerances and other conditions affecting performance.
  - 1. Proceed with installation only after unsatisfactory conditions have been corrected.
- B. Examine valve interior for cleanliness, freedom from foreign matter, and corrosion. Remove special packing materials, such as blocks, used to prevent disc movement during shipping and handling.
- C. Operate valves in positions from fully open to fully closed. Examine guides and seats made accessible by such operations.

- D. Examine threads on valve and mating pipe for form and cleanliness.
- E. Examine mating flange faces for conditions that might cause leakage. Check bolting for proper size, length, and material. Verify that gasket is of proper size, that its material composition is suitable for service, and that it is free from defects and damage.
- F. Do not attempt to repair defective valves; replace with new valves.

### **3.2 VALVE APPLICATIONS**

- A. Refer to piping Sections for specific valve applications. If valve applications are not indicated, use the following:
  - 1. Shutoff Service: Ball, butterfly, gate, or plug valves.
  - 2. Throttling Service: Ball, butterfly, or globe valves.
  - 3. Pump Discharge: Swing check, lift-disc check valves.
- B. If valves with specified SWP classes or CWP ratings are not available, the same types of valves with higher SWP class or CWP ratings may be substituted.
- C. Domestic Water Piping: Use the following types of valves:
  - 1. Ball Valves, NPS 2 (DN 50) and Smaller: Two-piece, [400-psig (2760-kPa)]CWP rating, copper alloy.
  - 2. Ball Valves, NPS 2-1/2 (DN 65) and Larger: Class 150, ferrous alloy.
  - 3. Swing Check Valves, NPS 2 (DN 50) and Smaller: Type 4, Class [125] [150], bronze.
  - 4. Swing Check Valves, NPS 2-1/2 (DN 65) and Larger: Type II, Class 125, gray iron.
  - 5. Gate Valves, NPS 2 (DN 50) and Smaller: Type [1] [2], Class 150] , bronze.
  - 6. Gate Valves, NPS 2-1/2 (DN 65) and Larger: Type I, Class 125, bronze-mounted cast iron.

### **3.3 VALVE INSTALLATION**

- A. Piping installation requirements are specified in other Division 15 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Install valves with unions or flanges at each piece of equipment arranged to allow service, maintenance, and equipment removal without system shutdown.
- C. Locate valves for easy access and provide separate support where necessary.
- D. Install valves in horizontal piping with stem at or above center of pipe.
- E. Install valves in position to allow full stem movement.

### **3.4 JOINT CONSTRUCTION**

- A. Refer to Division 15 Section "Basic Mechanical Materials and Methods" for basic piping joint construction.
- B. Grooved Joints: Assemble joints with keyed coupling housing, gasket, lubricant, and bolts according to coupling and fitting manufacturer's written instructions.
- C. Soldered Joints: Use ASTM B 813, water-flushable, lead-free flux; ASTM B 32, lead-free-alloy solder; and ASTM B 828 procedure, unless otherwise indicated.

**END OF SECTION**

**DIVISION 15140**  
**DOMESTIC WATER PIPING**

**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 domestic water piping from locations indicated to fixtures and equipment inside the building.
- B. Related Sections include the following:
  - 1. Division 15 Section "Plumbing Specialties" for water distribution piping specialties.
- C. PVC: Polyvinyl chloride plastic.

**1.3 PERFORMANCE REQUIREMENTS**

- A. Provide components and installation capable of producing domestic water piping systems with the following minimum working-pressure ratings, unless otherwise indicated:
  - 1. Domestic Water Distribution Piping: 125 psig (860 kPa).

**1.4 SUBMITTALS**

- A. Product Data: For pipe, tube, fittings, and couplings.
- B. Field Test Reports: Indicate and interpret test results for compliance with performance requirements.

**1.5 QUALITY ASSURANCE**

- A. Piping materials shall bear label, stamp, or other markings of specified testing agency.
- B. Comply with NSF 14, "Plastics Piping Components and Related Materials," for plastic, potable domestic water piping and components.
- C. Comply with NSF 61, "Drinking Water System Components-Health Effects; Sections 1 through 9," for potable domestic water piping and components.

**PART 2 - PRODUCTS**

**2.1 PIPING MATERIALS**

- A. Refer to Part 3 "Piping Applications" Article for applications of pipe, tube, fitting, and joining materials.
- B. Transition Couplings for Aboveground Pressure Piping: Coupling or other manufactured fitting the same size as, with pressure rating at least equal to and ends compatible with, piping to be joined.

- C. Transition Couplings for Underground Pressure Piping: AWWA C219, metal, sleeve-type coupling or other manufactured fitting the same size as, with pressure rating at least equal to and ends compatible with, piping to be joined.

## **2.2 COPPER TUBING**

- A. Soft Copper Tube: ASTM B 88, Types K and L, water tube, annealed temper.
  - 1. Copper Pressure Fittings: ASME B16.18, cast-copper-alloy or ASME B16.22, wrought-copper, solder-joint fittings. Furnish wrought-copper fittings if indicated.
  - 2. Bronze Flanges: ASME B16.24, Class 150, with solder-joint end. Furnish Class 300 flanges if required to match piping.
  - 3. Copper Unions: MSS SP-123, cast-copper-alloy, hexagonal-stock body, with ball-and-socket, metal-to-metal seating surfaces and solder-joint or threaded ends.
- B. Hard Copper Tube: ASTM B 88, Types L and M, water tube, drawn temper.
  - 1. Copper Pressure Fittings: ASME B16.18, cast-copper-alloy or ASME B16.22, wrought-copper, solder-joint fittings. Furnish wrought-copper fittings if indicated.
  - 2. Bronze Flanges: ASME B16.24, Class 150, with solder-joint end. Furnish Class 300 flanges if required to match piping.
  - 3. Copper Unions: MSS SP-123, cast-copper-alloy, hexagonal-stock body, with ball-and-socket, metal-to-metal seating surfaces and solder-joint or threaded ends.
  - 4. Copper, Grooved-End Fittings: ASTM B 75 (ASTM B 75M) copper tube or ASTM B 584 bronze castings.
    - a. Copper-Tubing, Keyed Couplings: Copper-tube dimensions and design similar to AWWA C606. Include ferrous housing sections, gasket suitable for hot water, and bolts and nuts.

## **2.3 PVC PIPING**

- A. PVC Schedule 40 Pipe:

## **2.4 VALVES**

- A. Refer to Division 15 Section "Valves" for bronze and cast-iron, general-duty valves.
- B. Refer to Division 15 Section "Plumbing Specialties" for balancing and drain valves.

## **PART 3 - EXECUTION**

### **3.1 EXCAVATION**

- A. Refer to Division 2 for excavating, trenching, and backfilling.

### **3.2 PIPING APPLICATIONS**

- A. Transition and special fittings with pressure ratings at least equal to piping rating may be used in applications below, unless otherwise indicated.
- B. Flanges may be used on aboveground piping, unless otherwise indicated.
- C. Grooved joints may be used on aboveground grooved-end piping.



- D. Fitting Option: Mechanically formed tee-branch outlets and brazed joints may be used on aboveground copper tubing.
- E. Aboveground Domestic Water Piping: Use the following piping materials for each size range:
  1. NPS 1-1/2 (DN 40) and Smaller: Hard copper tube, Type L (Type B); copper pressure fittings; and soldered joints.
  2. NPS 2 (DN 50): Hard copper tube, Type L (Type B); copper pressure fittings; and soldered joints.
  3. NPS 2-1/2 to NPS 3-1/2 (DN 65 to DN 90): Hard copper tube, Type L (Type B); copper pressure fittings; and soldered joints.
  4. NPS 4 to NPS 6 (DN 100 to DN150): Hard copper tube, Type L (Type B); copper pressure fittings; and soldered joints.
- F. Underground Domestic Water Piping NPS 4 (DN 100) and Smaller: Hard copper tube, Type L (Type B); copper pressure fittings; and soldered joints. Water service larger than NPS 4 shall be PVC.

### **3.3 VALVE APPLICATIONS**

- A. Drawings indicate valve types to be used. Where specific valve types are not indicated, the following requirements apply:
  1. Shutoff Duty: Use bronze ball or gate valves for piping NPS 2 (DN 50) and smaller. Use cast-iron butterfly or gate valves with flanged ends for piping NPS 2-1/2 (DN 65) and larger.
  2. Throttling Duty: Use bronze ball or globe valves for piping NPS 2 (DN 50) and smaller. Use cast-iron butterfly valves with flanged ends for piping NPS 2-1/2 (DN 65) and larger.
  3. Hot-Water-Piping, Balancing Duty: Calibrated balancing valves.
  4. Drain Duty: Hose-end drain valves.
- B. Cast-iron, grooved-end valves may be used with grooved-end piping.

### **3.4 PIPING INSTALLATION**

- A. Refer to Division 2 for site water distribution and service piping.
- B. Refer to Division 15 Section "Basic Mechanical Materials and Methods" for basic piping installation.
- C. Extend domestic water service piping to exterior water distribution piping in sizes and locations indicated.
- D. Install underground copper tubing according to CDA's "Copper Tube Handbook."
- E. Install underground PVC piping according to ASTM D 2774 and ASTM F 645. Install buried piping inside building between wall and floor penetrations and connection to water service piping outside building with restrained joints. Anchor pipe to wall or floor. Install thrust-block supports at vertical and horizontal offsets.
- F. Install cast-iron sleeve with water stop and mechanical sleeve seal at each service pipe penetration through foundation wall. Select number of interlocking rubber links

required to make installation watertight. Refer to Division 15 Section "Basic Mechanical Materials and Methods" for sleeves and mechanical sleeve seals.

- G. Install wall penetration system at each service pipe penetration through foundation wall. Make installation watertight. Refer to Division 15 Section "Basic Mechanical Materials and Methods" for wall penetration systems.
- H. Install shutoff valve, hose-end drain valve, strainer, pressure gage, and test tee with valve, inside building at each domestic water service. Refer to Division 15 Section "Meters and Gages" for pressure gages, and to Division 15 Section "Plumbing Specialties" for drain valves and strainers.
- I. Install water-pressure regulators downstream from shutoff valves. Refer to Division 15 Section "Plumbing Specialties" for water-pressure regulators.
- J. Fill water piping. Check components to determine that they are not air bound and that piping is full of water.
- K. Perform the following steps before operation:
  - 1. Close drain valves, hydrants, and hose bibbs.
  - 2. Open shutoff valves to fully open position.
  - 3. Open throttling valves to proper setting.
  - 4. Remove plugs used during testing of piping and plugs used for temporary sealing of piping during installation.
- L. Check plumbing equipment and verify proper settings, adjustments, and operation. Do not operate water heaters before filling with water.

### **3.5 JOINT CONSTRUCTION**

- A. Refer to Division 15 Section "Basic Mechanical Materials and Methods" for basic piping joint construction.
- B. Soldered Joints: Use ASTM B 813, water-flushable, lead-free flux; ASTM B 32, lead-free-alloy solder; and ASTM B 828 procedure, unless otherwise indicated.
- C. Grooved Joints: Assemble joints with keyed-coupling housing, gasket, lubricant, and bolts according to coupling and fitting manufacturer's written instructions.
- D. Mechanically Formed Outlets: Form tee in copper tube according to equipment manufacturer's written instructions. Use tool designed for copper tube; drill pilot hole, form collar for outlet, dimple tube to form seating stop, and braze branch tube into collar.

### **3.6 VALVE INSTALLATION**

- A. Install shutoff valve on each water supply to equipment and on each water supply to plumbing fixtures without supply stops. Use ball or gate valves for piping NPS 2 (DN 50) and smaller. Use butterfly or gate valves for piping NPS 2-1/2 (DN 65) and larger.
- B. Install calibrated balancing valves in each hot-water circulation return branch and discharge side of each pump and circulator. Set calibrated balancing valves partly open to restrict but not stop flow. Refer to Division 15 Section "Plumbing Specialties" for calibrated balancing valves.

### **3.7 HANGER AND SUPPORT INSTALLATION**

- A. Refer to Division 15 Section "Hangers and Supports" for pipe hanger and support devices. Install the following:
  - 1. Vertical Piping: MSS Type 8 or Type 42, clamps.
  - 2. Individual, Straight, Horizontal Piping Runs: According to the following:
    - a. 100 Feet (30 m) and Less: MSS Type 1, adjustable, steel clevis hangers.
    - b. Longer Than 100 Feet (30 m): MSS Type 43, adjustable roller hangers.
    - c. Longer Than 100 Feet (30 m), if Indicated: MSS Type 49, spring cushion rolls.
  - 3. Multiple, Straight, Horizontal Piping Runs 100 Feet (30 m) or Longer: MSS Type 44, pipe rolls. Support pipe rolls on trapeze.
  - 4. Base of Vertical Piping: MSS Type 52, spring hangers.
- B. Install supports according to Division 15 Section "Hangers and Supports."
- C. Support vertical piping and tubing at base and at each floor.
- D. Rod diameter may be reduced 1 size for double-rod hangers, to a minimum of 3/8 inch (10 mm).
- E. Install hangers for copper tubing with the following maximum horizontal spacing and minimum rod diameters:
  - 1. NPS 3/4 (DN 20) and Smaller: 60 inches (1500 mm) with 3/8-inch (10-mm) rod
  - 2. NPS 1 and NPS-1-1/4 (DN 25 and DN 32): 72 inches (1800 mm) with 3/8-inch (10mm) Rod.
  - 3. NPS 1-1/2 and NPS 2 (DN 40 and DN 50): 96 inches (2400 mm) with 3/8-inch (10mm) rod.
  - 4. NPS 2-1/2 (DN 65): 108 inches (2700 mm) with 1/2-inch (13 mm) rod.
  - 5. NPS 3 to NPS 5 (DN 80 to DN 125): 10 feet (3 m) with 1/2-inch (13 mm) rod.
  - 6. NPS 6 (DN 150): 10 feet (3 m) with 5/8-inch (16-mm) rod.
  - 7. NPS 8 (DN 200): 10 feet (3 m) with 3/4-inch (19-mm) rod.
- G. Install supports for vertical copper tubing every 10 feet (3m).

### **3.8 CONNECTIONS**

- A. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Install piping adjacent to equipment and machines to allow service and maintenance.
- C. Connect domestic water piping to exterior water service piping. Use transition fitting to join dissimilar piping materials.
- D. Connect domestic water piping to service piping with shutoff valve, and extend and connect to the following:
  - 1. Water Heaters: Cold-water supply and hot-water outlet piping in sizes indicated, but not smaller than sizes of water heater connections.

2. Plumbing Fixtures: Cold- and hot-water supply piping in sizes indicated, but not smaller than required by plumbing code. Refer to Division 15 Section "Plumbing Fixtures."
3. Equipment: Cold- and hot-water supply piping as indicated, but not smaller than equipment connections. Provide shutoff valve and union for each connection. Use flanges instead of unions for NPS 2-1/2 (DN 65) and larger.

### **3.9 FIELD QUALITY CONTROL**

- A. Inspect domestic water piping as follows:
  1. Do not enclose, cover, or put piping into operation until it is inspected and approved by authorities having jurisdiction.
  2. During installation, notify authorities having jurisdiction at least 24 hours before inspection must be made. Perform tests specified below in presence of authorities having jurisdiction:
    - a. Roughing-in Inspection: Arrange for inspection of piping before concealing or closing-in after roughing-in and before setting fixtures.
    - b. Final Inspection: Arrange for final inspection by authorities having jurisdiction to observe tests specified below and to ensure compliance with requirements.
  3. Reinspection: If authorities having jurisdiction find that piping will not pass test or inspection, make required corrections and arrange for reinspection.
  4. Reports: Prepare inspection reports and have them signed by authorities having jurisdiction.
- B. Test domestic water piping as follows:
  1. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired. If testing is performed in segments, submit separate report for each test, complete with diagram of portion of piping tested.
  2. Leave uncovered and unconcealed new, altered, extended, or replaced domestic water piping until it has been tested and approved. Expose work that was covered or concealed before it was tested.
  3. Cap and subject piping to static water pressure of 50 psig (345 kPa) above operating pressure, without exceeding pressure rating of piping system materials. Isolate test source and allow to stand for four hours. Leaks and loss in test pressure constitute defects that must be repaired.
  4. Repair leaks and defects with new materials and retest piping or portion thereof until satisfactory results are obtained.
  5. Prepare reports for tests and required corrective action.

### **3.10 ADJUSTING**

- A. Adjust balancing valves in hot-water-circulation return piping to provide adequate flow.
  1. Manually adjust ball-type balancing valves in hot-water-circulation return piping to provide flow of hot water in each branch.
  2. Adjust calibrated balancing valves to flows indicated.

### **3.11 CLEANING**

- A. Clean and disinfect potable domestic water piping as follows:
  - 1. Purge new piping and parts of existing domestic water piping that have been altered, extended, or repaired before using.
  - 2. Use purging and disinfecting procedures prescribed by authorities having jurisdiction or, if methods are not prescribed, procedures described in either AWWA C651 or AWWA C652 or as described below:
    - a. Flush piping system with clean, potable water until dirty water does not appear at outlets.
    - b. Fill and isolate system according to either of the following:
      - 1) Fill system or part thereof with water/chlorine solution with at least 50 ppm (50 mg/L) of chlorine. Isolate with valves and allow to stand for 24 hours.
      - 2) Fill system or part thereof with water/chlorine solution with at least 200 ppm (200 mg/L) of chlorine. Isolate and allow to stand for three hours.
    - c. Flush system with clean, potable water until no chlorine is in water coming from system after the standing time.
    - d. Submit water samples in sterile bottles to authorities having jurisdiction. Repeat procedures if biological examination shows contamination.
- B. Prepare and submit reports of purging and disinfecting activities.
- C. Clean interior of domestic water piping system. Remove dirt and debris as work progresses.

**END OF SECTION**

**DIVISION 15150**  
**SANITARY WASTE AND VENT PIPING**

**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 soil and waste, sanitary drainage and vent piping inside the building and to locations indicated.
- B. Related Sections include the following:
  - 1. Division 15 Section "Plumbing Specialties" for soil, waste, and vent piping systems specialties.

**1.3 DEFINITIONS**

- A. The following are industry abbreviations for plastic piping materials:
  - 1. PVC: Polyvinyl chloride plastic.

**1.4 PERFORMANCE REQUIREMENTS**

- A. Provide components and installation capable of producing piping systems with the following minimum working-pressure ratings, unless otherwise indicated:
  - 1. Soil, Waste, and Vent Piping: 10-foot head of water (30 kPa).

**1.5 SUBMITTALS**

- A. Product Data: For pipe, tube, fittings, and couplings.
- B. Shop Drawings: For sovent drainage system, include plans, elevations, sections, and details.
- C. Field Test Reports: Indicate and interpret test results for compliance with performance requirements.

**1.6 QUALITY ASSURANCE**

- A. Piping materials shall bear label, stamp, or other markings of specified testing agency.

## **PART 2 - PRODUCTS**

### **2.1 PIPING MATERIALS**

- A. Refer to Part 3 "Piping Applications" Article for applications of pipe, tube, fitting, and joining materials.
- B. Flexible Transition Couplings for Underground Nonpressure Piping: ASTM C 1173 with elastomeric sleeve. Include ends of same sizes as piping to be joined and include corrosion-resistant metal band on each end.

### **2.2 PVC PIPING**

- A. PVC Pipe: ASTM D 2665, solid-wall drain, waste, and vent.
  - 1. PVC Socket Fittings: ASTM D 2665, socket type, made to ASTM D 3311, drain, waste, and vent patterns.
- B. PVC Special Fittings: ASTM F 409, drainage-pattern tube and tubular fittings with ends as required for application.

## **PART 3 - EXECUTION**

### **3.1 EXCAVATION**

- A. Refer to Division 2 Section "Earthwork" for excavating, trenching, and backfilling.

### **3.2 PIPING APPLICATIONS**

- A. Transition and special fittings with pressure ratings at least equal to piping pressure ratings may be used in applications below, unless otherwise indicated.
- B. Flanges may be used on aboveground pressure piping, unless otherwise indicated.
- C. Aboveground, Soil, Waste, and Vent Piping: Use the following piping materials for each size range:
  - 1. NPS 1-1/4 and NPS 1-1/2 (DN 32 and DN 40): PVC pipe, PVC socket fittings, and solvent-cemented joints.
  - 2. NPS 2 to NPS 4 (DN 50 to DN 100): PVC pipe, PVC socket fittings, and solvent-cemented joints.
  - 3. NPS 5 and NPS 6 (DN 125 and DN 150): Use NPS 6 (DN 150) PVC pipe, PVC socket fittings, and solvent-cemented joints.
- D. Underground, Soil, Waste, and Vent Piping: Use the following piping materials for each size range:

1. NPS 2 to NPS 4 (DN 50 to DN 100): PVC pipe, PVC socket fittings, and solvent-cemented joints.
2. NPS 5 and NPS 6 (DN 125 and DN 150): PVC pipe, PVC socket fittings, and solvent-cemented joints.

### **3.3 PIPING INSTALLATION**

- A. Refer to Division 2 Section "Sanitary Sewerage" for Project-site sanitary sewer piping.
- B. Refer to Division 15 Section "Basic Mechanical Materials and Methods" for basic piping installation.
- C. Install cleanouts at grade and extend to where building sanitary drains connect to building sanitary sewers.
- D. Install cleanout fitting with closure plug inside the building in sanitary force-main piping.
  1. Encase piping with PE film according to ASTM A 674 or AWWA C105.
- E. Install cast-iron sleeve with water stop and mechanical sleeve seal at each service pipe penetration through foundation wall. Select number of interlocking rubber links required to make installation watertight. Refer to Division 15 Section "Basic Mechanical Materials and Methods" for sleeves and mechanical sleeve seals.
- F. Make changes in direction for soil and waste drainage and vent piping using appropriate branches, bends, and long-sweep bends. Sanitary tees and short-sweep  $\frac{1}{4}$  bends may be used on vertical stacks if change in direction of flow is from horizontal to vertical. Use long-turn, double Y-branch and 1/8- bend fittings if 2 fixture are installed back to back or side by side with common drain pipe. Straight tees, elbows, and crosses may be used on vent lines. Do not change direction of flow more than 90 degrees. Use proper size of standard increasers and reducers if pipes of different sizes are connected. Reducing size of drainage piping in direction of flow is prohibited.
- G. Lay buried building drainage piping beginning at low point of each system. Install true to grades and alignment indicated, with unbroken continuity of invert. Place hub ends of piping upstream. Install required gaskets according to manufacturer's written instructions for use of lubricants, cements, and other installation requirements. Maintain swab in piping and pull past each joint as completed.
- H. Re-verify building drainage piping slope before covering pipe in trench if left uncovered over a 24 hour period of subjected to exterior water. If slope of piping has changed, provide new shoring material to maintain original slope after trench has been covered.
- I. Install soil and waste drainage and vent piping at the code required minimum slopes, unless otherwise indicated:
- J. Install engineered soil and waste drainage and vent piping systems in locations indicated and as follows:



1. Combination Waste and Vent: Comply with standards of authorities having jurisdiction.
  2. Cast-Iron, Solvent, Single Stack: Comply with ASSE 1043 and solvent fitting manufacturer's written installation instructions.
  3. Reduced-Size Venting: Comply with standards of authorities having jurisdiction.
- K. Sleeves are not required for cast-iron soil piping passing through concrete slabs-on-grade if slab is without membrane waterproofing.
- L. Install PVC soil and waste drainage and vent piping according to ASTM D 2665.
- M. Install underground PVC soil and waste drainage piping according to ASTM D 2321.
- N. Do not enclose, cover, or put piping into operation until it is inspected and approved by authorities having jurisdiction.

### **3.4 JOINT CONSTRUCTION**

- A. Refer to Division 15 Section "Basic Mechanical Materials and Methods" for basic piping joint construction.
- B. PVC Nonpressure Piping Joints: Join piping according to ASTM D 2665.

### **3.5 HANGER AND SUPPORT INSTALLATION**

- A. Refer to Division 15 Section "Hangers and Supports" for pipe hanger and support devices. Install the following:
1. Vertical Piping: MSS Type 8 or Type 42, clamps.
  2. Individual, Straight, Horizontal Piping Runs: According to the following:
    - a. 100 Feet (30 m) and Less: MSS Type 1, adjustable, steel clevis hangers.
    - b. Longer Than 100 Feet (30 m): MSS Type 43, adjustable roller hangers.
    - c. Longer Than 100 Feet (30 m), if Indicated: MSS Type 49, spring cushion rolls.
  3. Multiple, Straight, Horizontal Piping Runs 100 Feet (30 m) or Longer: MSS Type 44, pipe rolls. Support pipe rolls on trapeze.
  4. Base of Vertical Piping: MSS Type 52, spring hangers.
- B. Install supports according to Division 15 Section "Hangers and Supports."
- C. Support vertical piping and tubing at base and at each floor.
- D. Rod diameter may be reduced 1 size for double-rod hangers, with 3/8-inch (10-mm) minimum rods.
- J. Install hangers for PVC piping with the following maximum horizontal spacing and minimum rod diameters:

1. NPS 1-1/2 and NPS 2 (DN 40 and DN 50): 48 inches (1200 mm) with 3/8-inch (10-mm) rod.
  2. NPS 3 (DN 80): 48 inches (1200 mm) with 1/2-inch (13-mm) rod.
  3. NPS 4 and NPS 5 (DN 100 and DN 125): 48 inches (1200 mm) with 5/8-inch (16-mm) rod.
  4. NPS 6 (DN 150): 48 inches (1200 mm) with 3/4-inch (19-mm) rod.
  5. NPS 8 to NPS 12 (DN 200 to DN 300): (1200 mm) with 7/8-inch (22-mm) rod.
- K. Install supports for vertical PVC piping every 48 inches (1200 mm).
- L. Support piping and tubing not listed above according to MSS SP-69 and manufacturer's written instructions.

### 3.6 CONNECTIONS

- A. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Connect soil and waste piping to exterior sanitary sewerage piping. Use transition fitting to join dissimilar piping materials.
- C. Connect drainage and vent piping to the following:
1. Plumbing Fixtures: Connect drainage piping in sizes indicated, but not smaller than required by plumbing code. Refer to Division 15 Section "Plumbing Fixtures."
  2. Plumbing Fixtures and Equipment: Connect atmospheric vent piping in sizes indicated, but not smaller than required by authorities having jurisdiction.
  3. Plumbing Specialties: Connect drainage and vent piping in sizes indicated, but not smaller than required by plumbing code. Refer to Division 15 Section "Plumbing Specialties."
  4. Equipment: Connect drainage piping as indicated. Provide shutoff valve, if indicated, and union for each connection. Use flanges instead of unions for connections NPS 2-1/2 (DN 65) and larger.

### 3.7 FIELD QUALITY CONTROL

- A. During installation, notify authorities having jurisdiction at least 24 hours before inspection must be made. Perform tests specified below in presence of authorities having jurisdiction.
1. Roughing-in Inspection: Arrange for inspection of piping before concealing or closing-in after roughing-in and before setting fixtures.
  2. Final Inspection: Arrange for final inspection by authorities having jurisdiction to observe tests specified below and to ensure compliance with requirements.
- B. Reinspection: If authorities having jurisdiction find that piping will not pass test or inspection, make required corrections and arrange for reinspection.

- C. Reports: Prepare inspection reports and have them signed by authorities having jurisdiction.
- D. Test sanitary drainage and vent piping according to procedures of authorities having jurisdiction or, in absence of published procedures, as follows:
  - 1. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired. If testing is performed in segments, submit separate report for each test, complete with diagram of portion of piping tested.
  - 2. Leave uncovered and unconcealed new, altered, extended, or replaced drainage and vent piping until it has been tested and approved. Expose work that was covered or concealed before it was tested.
  - 3. Roughing-in Plumbing Test Procedure: Test drainage and vent piping, except outside leaders, on completion of roughing-in. Close openings in piping system and fill with water to point of overflow, but not less than 10-foot head of water (30 kPa). From 15 minutes before inspection starts to completion of inspection, water level must not drop. Inspect joints for leaks.
  - 4. Finished Plumbing Test Procedure: After plumbing fixtures have been set and traps filled with water, test connections and prove they are gastight and watertight. Plug vent-stack openings on roof and building drains where they leave building. Introduce air into piping system equal to pressure of 1-inch wg (250 Pa). Use U-tube or manometer inserted in trap of water closet to measure this pressure. Air pressure must remain constant without introducing additional air throughout period of inspection. Inspect plumbing fixture connections for gas and water leaks.
  - 5. Repair leaks and defects with new materials and retest piping, or portion thereof, until satisfactory results are obtained.
  - 6. Prepare reports for tests and required corrective action.

### **3.8 CLEANING**

- A. Clean interior of piping. Remove dirt and debris as work progresses.
- B. Protect drains during remainder of construction period to avoid clogging with dirt and debris and to prevent damage from traffic and construction work.
- C. Place plugs in ends of uncompleted piping at end of day and when work stops.

**END OF SECTION**

**DIVISION 15410**  
**PLUMBING FIXTURES**

**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 plumbing fixtures and related components.
- B. Related Sections include the following:
  - 1. Division 15 Section "Drinking Fountains and Water Coolers."
  - 2. Division 15 Section "Plumbing Specialties" for backflow preventers and specialty fixtures not in this Section.

**1.3 DEFINITIONS**

- A. Accessible Fixture: Plumbing fixture that can be approached, entered, and used by people with disabilities.
- B. Fitting: Device that controls flow of water into or out of plumbing fixture. Fittings specified in this Section include supplies and stops, faucets and spouts, shower heads and tub spouts, drains and tailpieces, and traps and waste pipes. Piping and general-duty valves are included where indicated.

**1.4 SUBMITTALS**

- A. Product Data: Include selected fixture and trim, fittings, accessories, appliances, appurtenances, equipment, and supports and indicate materials and finishes, dimensions, construction details, and flow-control rates for each type of fixture indicated.

**1.5 QUALITY ASSURANCE**

- A. Source Limitations: Obtain plumbing fixtures, faucets, and other components of each category through one source from a single manufacturer.
  - 1. Exception: If fixtures, faucets, or other components are not available from a single manufacturer, obtain similar products from other manufacturers specified for that category.

- B. Regulatory Requirements: Comply with requirements in U.S. Architectural & Transportation Barriers Compliance Board's "Uniform Federal Accessibility Standards (UFAS), 1985-494-187" about plumbing fixtures for people with disabilities.
- C. Regulatory Requirements: Comply with requirements in Public Law 102-486, "Energy Policy Act," about water flow and consumption rates for plumbing fixtures.
- D. NSF Standard: Comply with NSF 61, "Drinking Water System Components--Health Effects," for fixture materials that will be in contact with potable water.
- E. TAS: Texas Accessibility Standards.

## **1.6 COORDINATION**

- A. Coordinate roughing-in and final plumbing fixture locations, and verify that fixtures can be installed to comply with original design and referenced standards.

## **PART 2 - PRODUCTS**

### **2.1 MANUFACTURERS**

- A. For fixture descriptions in other Part 2 articles where the subparagraph titles "Products," and "Manufacturers" introduce a list of manufacturers and their products or manufacturers only, the following requirements apply for product selection:
  - 1. Products: Subject to compliance with requirements, provide one of the products specified in other Part 2 articles.

### **2.2 LAVATORY FAUCETS**

- A. Lavatory Faucet: Include hot- and cold-water indicators; coordinate faucet inlets with supplies and fixture holes and outlet with spout and fixture receptor.
  - 1. Products:
    - a. American Standard.
    - b. Eljer.
    - c. Kohler.

### **2.3 SHOWER FAUCETS**

- A. Shower Faucet: Include hot- and cold-water indicators; tub spout; and shower head, arm, and flange. Coordinate faucet inlets with supplies and outlet with diverter valve.
  - 1. Manufacturers:
    - a. American Standard.
    - b. Eljber.
    - c. Kohler.

## **2.4 SINK FAUCETS**

- A. Sink Faucet: Include hot- and cold-water indicators; coordinate faucet inlets with supplies and fixture holes and outlet with spout and fixture receptor.
  - 1. Manufacturers:
    - a. American Standard.
    - b. Eljer
    - c. Kohler.

## **2.5 TOILET SEATS**

- A. Toilet Seat: Solid plastic.
  - 1. Manufacturers:
    - a. Bemis.
    - b. Beneke.
    - c. Centoco.
    - d. Church.

## **2.6 PROTECTIVE SHIELDING GUARDS**

- A. Protective Shielding Guard, Manufactured, plastic enclosure for covering for hot- and cold-water supplies and trap and drain piping and complying with ADA requirements.
  - 1. Manufacturers:
    - a. Engineered Brass Co.
    - b. Plumerex
    - c. Truebro.

## **2.7 FIXTURE SUPPORTS**

- A. Water-Closet Support: Water-closet combination carrier designed for accessible and standard mounting heights. Include single or double, vertical or horizontal, hub-and-spigot or hubless waste fitting as required for piping arrangement; faceplates; couplings with gaskets; feet; and fixture bolts and hardware matching fixture. Include additional extension coupling, faceplate, and feet for installation in wide pipe space.
  - 1. Manufacturers:
    - a. Mifab
    - b. Josam.
    - c. Wade.
    - d. Zurn
  
- B. Urinal Support: Type I, urinal carrier with fixture support plates and coupling with seal and fixture bolts and hardware matching fixture. Include steel uprights with feet.
  - 1. Manufacturers:

- a. Josam.
  - b. J.R. Smith
  - c. Zurn.
- 2. Accessible Fixture Support: Include rectangular steel uprights.
- C. Lavatory Support: Type II, lavatory carrier with concealed arms and tie rod. Include steel uprights with feet.
  - 1. Manufacturers:
    - a. Josam.
    - b. J.R. Smith
    - c. Zurn.
  - 2. Accessible Fixture Support: Include rectangular steel uprights.
- D. Sink Support: Type II, sink carrier with hanger plate, bearing studs, and tie rod. Include steel uprights with feet.
  - 1. Manufacturers:
    - a. Josam.
    - b. J.R. Smith
    - c. Zurn.

## **2.8 WATER CLOSETS**

- A. Water Closets: Accessible, wall-hanging, back-outlet, vitreous-china fixture designed for flushometer valve operation.
  - 1. Products:
    - a. American Standard, Inc.
    - b. Kohler Co.
    - c. TOTO USA, Inc.
- B. Water Closets: Accessible, floor mounting, floor-outlet, vitreous-china fixture designed for flushometer valve operation.
  - 1. Products:
    - a. American Standard, Inc.
    - b. Kohler Co.
    - c. TOTO USA, Inc.

## **2.9 URINALS**

- A. Urinals,: Accessible, wall-hanging, back-outlet, vitreous-china fixture designed for flushometer valve operation.
  - 1. Products:
    - a. American Standard, Inc.
    - b. Kohler Co.

- c. TOTO USA, Inc.

## **2.10 LAVATORIES, SINKS**

- A. Lavatories,: Accessible, wall hanging, vitreous-china fixture.
  - 1. Products:
    - a. American Standard, Inc.
    - b. Kohler Co.
    - c. Toto

## **2.11 KITCHEN SINKS**

- A. Kitchen Sinks: Commercial, counter-mounting, stainless-steel fixture.
  - 1. Products:
    - a. Elkay Manufacturing Co.
    - b. Just Manufacturing Co.

## **2.12 SERVICE SINKS**

- A. Service Sinks: Floor-mounting, enameled, sink with front apron, raised back, and coated, wire rim guard.
  - 1. Products:
    - a. Commercial Enameling Co.
    - b. Kohler Co.
    - c. Fiat

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Examine roughing-in for water soil and for waste piping systems and supports to verify actual locations and sizes of piping connections and that locations and types of supports match those indicated, before plumbing fixture installation. Use manufacturer's roughing-in data if roughing-in data are not indicated.
- B. Examine walls, floors, and cabinets for suitable conditions where fixtures are to be installed.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.2 FIXTURE INSTALLATION**



- A. Assemble fixtures, trim, fittings, and other components according to manufacturers' written instructions.
- B. For wall-hanging fixtures, install off-floor supports affixed to building substrate.
  - 1. Use carrier supports with waste fitting and seal for back-outlet fixtures.
  - 2. Use chair-type carrier supports with rectangular steel uprights for accessible fixtures.
- C. Install back-outlet, wall-hanging fixtures onto waste fitting seals and attach to supports.
- D. Install floor-mounting fixtures on closet flanges or other attachments to piping or building substrate.
- E. Install wall-hanging fixtures with tubular waste piping attached to supports.
- F. Install floor-mounting, back-outlet water closets attached to building floor substrate and wall bracket and onto waste fitting seals.
- G. Install counter-mounting fixtures in and attached to casework.
- H. Install fixtures level and plumb according to manufacturers' written instructions and roughing-in drawings.
- I. Install water-supply piping with stop on each supply to each fixture to be connected to water distribution piping. Attach supplies to supports or substrate within pipe spaces behind fixtures. Install stops in locations where they can be easily reached for operation.
  - 1. Exception: Use ball, gate, or globe valve if stops are not specified with fixture. Refer to Division 15 Section "Valves" for general-duty valves.
- J. Install trap and tubular waste piping on drain outlet of each fixture to be directly connected to sanitary drainage system.
- K. Install tubular waste piping on drain outlet of each fixture to be indirectly connected to drainage system.
- L. Install flushometer valves for accessible water closets and urinals with handle mounted on wide side of compartment. Install other actuators in locations that are easy for people with disabilities to reach.
- M. Install toilet seats on water closets.
- N. Install faucet-spout fittings with specified flow rates and patterns in faucet spouts if faucets are not available with required rates and patterns. Include adapters if required.
- O. Install water-supply, flow-control fittings with specified flow rates in fixture supplies at stop valves.

- P. Install faucet, flow-control fittings with specified flow rates and patterns in faucet spouts if faucets are not available with required rates and patterns. Include adapters if required.
- Q. Install traps on fixture outlets.
- R. Install escutcheons at piping wall ceiling penetrations in exposed, finished locations and within cabinets and millwork. Use deep-pattern escutcheons if required to conceal protruding fittings. Refer to Division 15 Section "Basic Mechanical Materials and Methods" for escutcheons.
- S. Seal joints between fixtures and walls, floors, and counters using sanitary-type, one-part, mildew-resistant, silicone sealant. Match sealant color to fixture color. Refer to Division 7 Section "Joint Sealants" for sealant and installation requirements.

### **3.3 CONNECTIONS**

- A. Piping installation requirements are specified in other Division 15 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Connect water supplies from water distribution piping to fixtures.
- C. Connect drain piping from fixtures to drainage piping.
- D. Supply and Waste Connections to Plumbing Fixtures: Connect fixtures with water supplies, stops, risers, traps, and waste piping. Use size fittings required to match fixtures. Connect to plumbing piping.
- E. Supply and Waste Connections to Fixtures and Equipment Specified in Other Sections: Connect fixtures and equipment with water supplies, stops, risers, traps, and waste piping specified. Use size fittings required to match fixtures and equipment. Connect to plumbing piping.
- F. Ground equipment.
  - 1. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

### **3.4 FIELD QUALITY CONTROL**

- A. Verify that installed fixtures are categories and types specified for locations where installed.
- B. Check that fixtures are complete with trim, faucets, fittings, and other specified components.
- C. Inspect installed fixtures for damage. Replace damaged fixtures and components.

- D. Test installed fixtures after water systems are pressurized for proper operation. Replace malfunctioning fixtures and components, then retest. Repeat procedure until units operate properly.

### **3.5 ADJUSTING**

- A. Operate and adjust faucets and controls. Replace damaged and malfunctioning fixtures, fittings, and controls.
- B. Adjust water pressure at faucets, shower valves, and flushometer valves to produce proper flow and stream.
- C. Replace washers and seals of leaking and dripping faucets and stops.

### **3.6 CLEANING**

- A. Clean fixtures, faucets, and other fittings with manufacturers' recommended cleaning methods and materials. Do the following:
  - 1. Remove faucet spouts and strainers, remove sediment and debris, and reinstall strainers and spouts.
  - 2. Remove sediment and debris from drains.

### **3.7 PROTECTION**

- A. Provide protective covering for installed fixtures and fittings.
- B. Do not allow use of fixtures for temporary facilities unless approved in writing by Owner.

**END OF SECTION**

**DIVISION 15415**  
**DRINKING FOUNTAINS AND WATER COOLERS**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. This Section includes the following:
  - 1. Drinking fountains.
  - 2. Self-contained water coolers.
  - 3. Fixture supports.

**1.3 DEFINITIONS**

- A. Accessible Drinking Fountain and Water Cooler: Fixture that can be approached and used by people with disabilities.
- B. Drinking Fountain: Fixture with nozzle for delivering stream of water for drinking.
- C. Fitting: Device that controls flow of water into or out of fixture.
- D. Fixture: Drinking fountain or water cooler, unless one is specifically indicated.
- E. Water Cooler: Electrically powered fixture for generating and delivering cooled drinking water.

**1.4 SUBMITTALS**

- A. Product Data: Include rated capacities; shipping, installed, and operating weights; furnished specialties; and accessories for each type of fixture indicated.
- B. Shop Drawings: Diagram power, signal, and control wiring and differentiate between manufacturer-installed and field-installed wiring.
- C. Maintenance Data: For fixtures to include in maintenance manuals specified in Division 1.

**1.5 QUALITY ASSURANCE**

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Regulatory Requirements: Comply with requirements in ICC A117.1, "Accessible and Usable Buildings and Facilities" about fixtures for people with disabilities.
- C. NSF Standard: Comply with NSF 61, "Drinking Water System Components--Health Effects," for fixture materials that will be in contact with potable water.
- D. ARI Standard: Comply with ARI 1010, "Self-Contained, Mechanically Refrigerated Drinking-Water Coolers," for water coolers and with ARI's "Directory of Certified Drinking Water Coolers" for type and style classifications.
- E. TAS: Texas Accessibility Standards.

## **1.6 COORDINATION**

- A. Coordinate roughing-in and final fixture locations, and verify that fixtures can be installed to comply with original design and referenced standards.

## **PART 2 - PRODUCTS**

### **2.1 MANUFACTURERS**

- A. Manufacturers: Subject to compliance with requirements, provide products by the manufacturers specified below.
  - 1. Elkay.
  - 2. Halsey Taylor.
  - 3. Haws Corporation.

### **2.2 DRINKING FOUNTAINS**

- A. Drinking Fountains,: Accessible, Style W, wall-hanging fixture made of stainless steel.
  - 1. Receptor Shape: Rectangular.
  - 2. Back Panel: Stainless-steel wall plate behind drinking fountain.
  - 3. Bubblers: Two, with automatic stream regulator, located on deck.
  - 4. Control: Push button.
  - 5. Supply: NPS 3/8 (DN 10) with ball, gate, or globe valve.
  - 6. Drain: Grid with NPS 1-1/4 (DN 32) minimum horizontal waste and trap complying with ASME Standards.
  - 7. Support: Type I, water-cooler carrier. Refer to "Fixture Supports" Article.

### **2.3 SELF-CONTAINED WATER COOLERS**

- A. Water Coolers: Accessible, ARI 1010, Type PB, pressure with bubbler, Style W, wall-hanging fixture.
1. Cabinet: Bilevel with two attached cabinets, enameled steel with stainless-steel top.
  2. Bubbler: One, with automatic stream regulator, located on each cabinet deck.
  3. Control: Push button.
  4. Supply: NPS 3/8 (DN 10) with ball, gate, or globe valve and filter.
  5. Drain: Grid with NPS 1-1/4 (DN 32) minimum horizontal waste and trap complying with ASME Standards.
  6. Cooling System: Electric, with hermetically sealed compressor, cooling coil, air-cooled condensing unit, corrosion-resistant tubing, refrigerant, corrosion-resistant-metal storage tank, and adjustable thermostat.
    - a. Capacity: 8 gph (0.0084 L/s) of 50 deg F (10 deg C) cooled water from 80 deg F (27 deg C) inlet water and 90 deg F (32 deg C) ambient air temperature.
    - b. Electrical Characteristics: 1/5 hp; 120-V ac; single phase; 60 Hz.
  7. Support: Type II, water-cooler carrier. Refer to "Fixture Supports" Article.

## 2.4 FIXTURE SUPPORTS

- A. Off-Floor, Plumbing Fixture Supports: ASME A112.6.1M, water-cooler carriers. Include vertical, steel uprights with feet and tie rods and bearing plates with mounting studs matching fixture to be supported.
1. Available Manufacturers:
  2. Manufacturers:
    - a. Josam Co.
    - b. Smith, Jay R. Mfg. Co.
    - c. Tyler Pipe; Wade Div.
    - d. Zurn Specifications Drainage Operation.
  3. Type I: Hanger-type carrier with two vertical uprights.
  4. Type II: Bilevel, hanger-type carrier with three vertical uprights.
  5. Supports for Accessible Fixtures: Include rectangular, vertical, steel uprights instead of steel pipe uprights.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine roughing-in for water and waste piping systems to verify actual locations of piping connections before fixture installation. Verify that sizes and locations of piping and types of supports match those indicated.

- B. Examine walls and floors for suitable conditions where fixtures are to be installed.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.2 APPLICATIONS**

- A. Use carrier off-floor supports for wall-hanging fixtures, unless otherwise indicated.
- B. Use chrome-plated brass or copper tube, fittings, and valves in locations exposed to view. Plain copper tube, fittings, and valves may be used in concealed locations.

### **3.3 INSTALLATION**

- A. Install off-floor supports affixed to building substrate and attach wall-hanging fixtures, unless otherwise indicated.
- B. Install mounting frames affixed to building construction and attach recessed water coolers to mounting frames, unless otherwise indicated.
- C. Install fixtures level and plumb.
- D. Install water-supply piping with shutoff valve on supply to each fixture to be connected to water distribution piping. Use ball, gate, or globe valve. Install valves in locations where they can be easily reached for operation. Refer to Division 15 Section "Valves" for general-duty valves.
- E. Install trap and waste piping on drain outlet of each fixture to be connected to sanitary drainage system.
- F. Install pipe escutcheons at wall penetrations in exposed, finished locations. Use deep-pattern escutcheons where required to conceal protruding pipe fittings. Refer to Division 15 Section "Basic Mechanical Materials and Methods" for escutcheons.
- G. Seal joints between fixtures and walls and floors using sanitary-type, one-part, mildew-resistant, silicone sealant. Match sealant color to fixture color. Refer to Division 7 for sealant and installation requirements.

### **3.4 CONNECTIONS**

- A. Piping installation requirements are specified in other Division 15 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Connect water supplies from water distribution piping to fixtures.
- C. Connect drain piping from fixtures to drainage piping.
- D. Ground equipment.

1. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

**END OF SECTION**



**DIVISION 15430**  
**PLUMBING SPECIALTIES**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. This Section includes the following plumbing specialties:
  - 1. Balancing valves.
  - 2. Washer-supply outlets.
  - 3. Key-operation hydrants.
  - 4. Trap seal primer valves.
  - 5. Drain valves.
  - 6. Miscellaneous piping specialties.
  - 7. Sleeve penetration systems.
  - 8. Flashing materials.
  - 9. Cleanouts.
  - 10. Floor drains.
  - 11. Roof drains.
  - 12. Grease interceptors.

**1.3 DEFINITIONS**

- A. The following are industry abbreviations for plastic piping materials:
  - 1. ABS: Acrylonitrile-butadiene-styrene plastic.
  - 2. PVC: Polyvinyl chloride plastic.

**1.4 PERFORMANCE REQUIREMENTS**

- A. Provide components and installation capable of producing piping systems with following minimum working-pressure ratings, unless otherwise indicated:
  - 1. Domestic Water Piping: 125 psig (860 kPa).
  - 2. Sanitary Waste and Vent Piping: 10-foot head of water (30 kPa).
  - 3. Storm Drainage Piping: 10-foot head of water (30 kPa).

**1.5 SUBMITTALS**

- A. Product Data: Include rated capacities and shipping, installed, and operating weights. Indicate materials, finishes, dimensions, required clearances, and methods of assembly of components; and piping and wiring connections for the following:
  - 1. Balancing valves.
  - 2. Water hammer arresters, and trap seal primer valves and systems.
  - 3. Hose bibbs, hydrants.
  - 4. Washer-supply outlets.
  - 5. Cleanouts, floor drains, and roof drains.
  - 6. Roof flashing assemblies.
  - 7. Grease interceptors.
  - 8. Sleeve penetration systems.
- B. Shop Drawings: Diagram power, signal, and control wiring.

## **1.6 QUALITY ASSURANCE**

- A. Product Options: Drawings indicate size, profiles, and dimensional requirements of plumbing specialties and are based on the specific system indicated. Refer to Division 1 Section "Product Requirements."
- B. Plumbing specialties shall bear label, stamp, or other markings of specified testing agency.
- C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- D. ASME Compliance: Comply with ASME B31.9, "Building Services Piping," for piping materials and installation.
- E. NSF Compliance:
  - 1. Comply with NSF 14, "Plastics Piping Components and Related Materials," for plastic domestic water piping components. Include marking "NSF-pw" on plastic potable-water piping and "NSF-dwv" on plastic drain, waste, and vent piping.
  - 2. Comply with NSF 61, "Drinking Water System Components--Health Effects, Sections 1 through 9," for potable domestic water plumbing specialties.

## **PART 2 - PRODUCTS**

### **2.1 BALANCING VALVES**

- A. Calibrated Balancing Valves: Adjustable, with two readout ports and memory setting indicator. Include manufacturer's standard hoses, fittings, valves, differential pressure meter, and carrying case.
  - 1. Manufacturers:
    - a. Armstrong Pumps, Inc.

- b. Flow Design, Inc.
  - c. ITT Industries; Bell & Gossett Div.
  - d. Taco, Inc.
  - e. Watts Industries, Inc.; Water Products Div.
2. NPS 2 (DN 50) and Smaller: Bronze body with brass ball, adjustment knob, calibrated nameplate, and threaded or solder-joint ends.
  3. NPS 2 (DN 50) and Smaller: Bronze, Y-pattern body with adjustment knob and threaded ends.
  4. NPS 2-1/2 (DN 65) and Larger: Cast-iron, Y-pattern body with bronze disc and flanged or grooved ends.
- B. Memory-Stop Balancing Valves, NPS 2 (DN 50) and smaller: MSS SP-110, ball valve, rated for 400-psig (2760-kPa) minimum CWP. Include two-piece, copper-alloy body with full-port, chrome-plated brass ball, replaceable seats and seals, threaded or solder-joint ends, and vinyl-covered steel handle with memory-stop device.
1. Manufacturers:
    - a. Conbraco Industries, Inc.
    - b. Crane Co., Crane Valve Group; Crane Valves.
    - c. Grinnell Corporation.
    - d. NIBCO INC.
    - e. Red-White Valve Corp.

## 2.2 STRAINERS

- A. Strainers: Y-pattern, unless otherwise indicated, and full size of connecting piping. Include ASTM A 666, Type 304, stainless-steel screens with 3/64-inch (1.2-mm) round perforations, unless otherwise indicated.
1. Pressure Rating: 125-psig (860-kPa) minimum steam working pressure, unless otherwise indicated.
  2. NPS 2 (DN 50) and Smaller: Bronze body, with female threaded ends.
  3. NPS 2-1/2 (DN 65) and Larger: Cast-iron body, with interior AWWA C550 or FDA-approved, epoxy coating and flanged ends.

## 2.3 OUTLET BOXES

- A. Manufacturers:
1. Acorn Engineering Company.
  2. Gray, Guy Manufacturing Co., Inc.
  3. Symmons Industries, Inc.
- B. General: Recessed-mounting outlet boxes with supply fittings complying with ASME A112.18.1M. Include box with faceplate, services indicated for equipment connections, and wood-blocking reinforcement.

- C. Clothes Washer Outlet Boxes: With hot- and cold-water hose connections, drain, and the following:
1. Box and Faceplate: [Stainless steel] [Enameled or epoxy-painted steel].
  2. Shutoff Fitting: Two hose bibbs.
  3. Supply Fittings: Two NPS 1/2 (DN 15) gate, globe, or ball valves and NPS 1/2 (DN 15) copper, water tubing.
  4. Drain: NPS 2 (DN 50) standpipe, P-trap, and direct waste connection to drainage piping.
  5. Inlet Hoses: Two ASTM D 3571, 60-inch- (1500-mm-) long, rubber household clothes washer inlet hoses with female hose-thread couplings.
  6. Drain Hose: One 48-inch- (1200-mm-) long, rubber household clothes washer drain hose with hooked end.
- D. Icemaker Outlet Boxes: With hose connection and the following:
1. Box and Faceplate: Stainless steel.
  2. Shutoff Fitting: Hose bibb.
  3. Supply Fitting: NPS 1/2 (DN 15) gate, globe, or ball valve and NPS 1/2 (DN 15) copper, water tubing.

## 2.4 KEY-OPERATION HYDRANTS

- A. Manufacturers:
1. Josam Co.
  2. Smith, Jay R. Mfg. Co.
  3. Woodford Manufacturing Co.
- B. General: ASME A112.21.3M, key-operation hydrant with pressure rating of 125 psig (860 kPa).
1. Inlet: NPS 3/4 or NPS 1 (DN 20 or DN 25) threaded or solder joint.
  2. Outlet: ASME B1.20.7, garden-hose threads.
  3. Operating Keys: One with each key-operation hydrant.
- C. Moderate-Climate, Concealed-Outlet Wall Hydrants: ASSE 1019, self-drainable with flush-mounting box with cover, integral nonremovable hose-connection vacuum breaker, and concealed outlet.
1. Classification: Type A, for automatic draining with hose removed or Type B, for automatic draining with hose removed or with hose attached and nozzle closed.
- D. Hot and Cold, Nonfreeze Concealed-Outlet Wall Hydrants: With deep flush-mounting box with cover; hot- and cold-water casings and operating rods to match wall thickness; concealed outlet; wall clamps; and factory- or field-installed, nonremovable and manual drain-type, hose-connection vacuum breaker complying with ASSE 1011.

## 2.5 TRAP SEAL PRIMER VALVES

- A. Supply-Type Trap Seal Primer Valves: ASSE 1018, water-supply-fed type, with the following characteristics:
1. Manufacturers:
    - a. Josam Co.
    - b. MIFAB Manufacturing, Inc.
    - c. Precision Plumbing Products, Inc.
    - d. Smith, Jay R. Mfg. Co.
  2. 125-psig (860-kPa) minimum working pressure.
  3. Bronze body with atmospheric-vented drain chamber.
  4. Inlet and Outlet Connections: NPS 1/2 (DN 15) threaded, union, or solder joint.
  5. Gravity Drain Outlet Connection: NPS 1/2 (DN 15) threaded or solder joint.
  6. Finish: Chrome plated, or rough bronze for units used with pipe or tube that is not chrome finished.

## 2.6 MISCELLANEOUS PIPING SPECIALTIES

- A. Water Hammer Arresters: ASSE 1010 or PDI-WH 201, metal-bellows type with pressurized metal cushioning chamber. Sizes indicated are based on ASSE 1010 or PDI-WH 201, Sizes A through F.
1. Manufacturers:
    - a. Josam Co.
    - b. Smith, Jay R. Mfg. Co.
    - c. Tyler Pipe; Wade Div.
    - d. Zurn Industries, Inc.; Specification Drainage Operation.
- B. Hose Bibbs: Bronze body with replaceable seat disc complying with ASME A112.18.1M for compression-type faucets. Include NPS 1/2 or NPS 3/4 (DN 15 or DN 20) threaded or solder-joint inlet, of design suitable for pressure of at least 125 psig (860 kPa); integral [or field-installed,] nonremovable, drainable hose-connection vacuum breaker; and garden-hose threads complying with ASME B1.20.7 on outlet.
- C. Roof Flashing Assemblies: Manufactured assembly made of [4-lb/sq. ft. (20-kg/sq. m), 0.0625-inch- (1.6-mm-)] [6-lb/sq. ft. (30-kg/sq. m), 0.0938-inch- (2.4-mm-)] thick, lead flashing collar and skirt extending at least [6 inches (150 mm)] [8 inches (200 mm)] [10 inches (250 mm)] from pipe with galvanized steel boot reinforcement, and counterflashing fitting.
- D. Floor-Drain Inlet Fittings: Cast iron, with threaded inlet and threaded or spigot outlet, and trap seal primer valve connection.
- E. Fixed Air-Gap Fittings: Manufactured cast-iron or bronze drainage fitting with semiopen top with threads or device to secure drainage inlet piping in top and bottom spigot or threaded outlet larger than top inlet. Include design complying with ASME A112.1.2 that will provide fixed air gap between installed inlet and outlet piping.
- F. Stack Flashing Fittings: Counterflashing-type, cast-iron fitting, with bottom recess for terminating roof membrane, and with threaded or hub top for extending vent pipe.

- G. Vent Caps: Cast-iron body with threaded or hub inlet and vandal-proof design. Include vented hood and set-screws to secure to vent pipe.
- H. Vent Terminals: Commercially manufactured, shop- or field-fabricated, frost-proof assembly constructed of galvanized steel, copper, or lead-coated copper. Size to provide 1-inch (25-mm) enclosed air space between outside of pipe and inside of flashing collar extension, with counterflashing.
- I. Expansion Joints: ASME A112.21.2M, assembly with cast-iron body with bronze sleeve, packing gland, and packing; of size and end types corresponding to connected piping.

## 2.7 SLEEVE PENETRATION SYSTEMS

- A. Manufacturers:
  - 1. ProSet Systems, Inc.
- B. Description: UL 1479, through-penetration firestop assembly consisting of sleeve and stack fitting with firestopping plug.
  - 1. Sleeve: Molded PVC plastic, of length to match slab thickness and with integral nailing flange on one end for installation in cast-in-place concrete slabs.
  - 2. Stack Fitting: ASTM A 48 (ASTM A 48M), gray-iron, hubless-pattern, wye-branch stack fitting with neoprene O-ring at base and gray-iron plug in thermal-release harness in branch. Include PVC protective cap for plug.
    - a. Special Coating: Include corrosion-resistant interior coating on fittings for plastic chemical waste and vent stacks.

## 2.8 FLASHING MATERIALS

- A. Lead Sheet: ASTM B 749, Type L51121, copper bearing, with the following minimum weights and thicknesses, unless otherwise indicated:
  - 1. General Use: 4-lb/sq. ft. (20-kg/sq. m), 0.0625-inch (1.6-mm) thickness.
  - 2. Vent Pipe Flashing: 3-lb/sq. ft. (15-kg/sq. m), 0.0469-inch (1.2-mm) thickness.
  - 3. Burning: 6-lb/sq. ft. (30-kg/sq. m), 0.0938-inch (2.4-mm) thickness.
- B. Elastic Membrane Sheet: ASTM D 4068, flexible, chlorinated polyethylene, 40-mil (1.01-mm) minimum thickness.
- C. Fasteners: Metal compatible with material and substrate being fastened.
- D. Metal Accessories: Sheet metal strips, clamps, anchoring devices, and similar accessory units required for installation; matching or compatible with material being installed.
- E. Solder: ASTM B 32, lead-free alloy.

- F. Bituminous Coating: SSPC-Paint 12, solvent-type, bituminous mastic.

## **2.9 CLEANOUTS**

- A. Cleanouts: Comply with [ASME A112.36.2M] [ASME A112.3.1] <Insert other>.
  - 1. Application: [Floor cleanout] [Wall cleanout] [For installation in exposed piping].
  - 2. Products:
    - a. Josam Co.
    - b. Mifab
    - c. Smith, Jay R. Mfg. Co.
    - d. Tyler Pipe, Wade Div.
    - e. Zurn Industries, Inc., Specification Drainage Operation.

## **2.10 FLOOR DRAINS**

- A. Floor Drains.
  - 1. Products:
    - a. Josam Co.
    - b. Mifab
    - c. Smith, Jay R. Mfg. Co.
    - d. Tyler Pipe, Wade Div.
    - e. Zurn Industries, Inc.

## **2.11 ROOF DRAINS**

- A. Roof Drains: Comply with [ASME A112.21.2M] [ASME A112.3.1].
  - 1. Application: Roof drain.
  - 2. Products:
    - a. Josam Co.
    - b. Mifab
    - c. Smith, Jay R. Mfg. Co.
    - d. Tyler Pipe, Wade Div.
    - e. Watts Industries, Inc., Drainage Products Div.
    - f. Zurn Industries, Inc.

## **2.12 GREASE INTERCEPTORS**

- A. Grease Interceptors: Comply with PDI-G101.
  - 1. Products:
    - a. American Industrial Precast Products, Inc.
    - b. Brooks Products
    - c. Park Equipment Co.

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION**

- A. Refer to Division 15 Section "Basic Mechanical Materials and Methods" for piping joining materials, joint construction, and basic installation requirements.
- B. Install pressure regulators with inlet and outlet shutoff valves and balance valve bypass. Install pressure gages on inlet and outlet.
- C. Install strainers on supply side of each control valve, pressure regulator, and solenoid valve.
- D. Install trap seal primer valves with outlet piping pitched down toward drain trap a minimum of 1 percent and connect to floor-drain body, trap, or inlet fitting. Adjust valve for proper flow.
- E. Install backwater valves in building drain piping. For interior installation, provide cleanout deck plate flush with floor and centered over backwater valve cover, and of adequate size to remove valve cover for servicing.
- F. Install expansion joints on vertical risers, stacks, and conductors if indicated.
- G. Install cleanouts in aboveground piping and building drain piping according to the following, unless otherwise indicated:
  - 1. Size same as drainage piping up to NPS 4 (DN 100). Use NPS 4 (DN 100) for larger drainage piping unless larger cleanout is indicated.
  - 2. Locate at each change in direction of piping greater than 45 degrees.
  - 3. Locate at minimum intervals of 50 feet (15 m) for piping NPS 4 (DN 100) and smaller and 100 feet (30 m) for larger piping.
  - 4. Locate at base of each vertical soil and waste stack.
- H. Install cleanout deck plates with top flush with finished floor, for floor cleanouts for piping below floors.
- I. Install cleanout wall access covers, of types indicated, with frame and cover flush with finished wall, for cleanouts located in concealed piping.
- J. Install flashing flange and clamping device with each stack and cleanout passing through floors with waterproof membrane.
- K. Install vent flashing sleeves on stacks passing through roof. Secure over stack flashing according to manufacturer's written instructions.
- L. Install frost-proof vent caps on each vent pipe passing through roof. Maintain 1-inch (25-mm) clearance between vent pipe and roof substrate.
- M. Install floor drains at low points of surface areas to be drained. Set grates of drains flush with finished floor, unless otherwise indicated.



1. Position floor drains for easy access and maintenance.
  2. Set floor drains below elevation of surrounding finished floor to allow floor drainage. Set with grates depressed according to the following drainage area radii:
    - a. Radius, 30 Inches (750 mm) or Less: Equivalent to 1 percent slope, but not less than 1/4-inch (6.35-mm) total depression.
    - b. Radius, 30 to 60 Inches (750 to 1500 mm): Equivalent to 1 percent slope.
    - c. Radius, 60 Inches (1500 mm) or Larger: Equivalent to 1 percent slope, but not greater than 1-inch (25-mm) total depression.
  3. Install floor-drain flashing collar or flange so no leakage occurs between drain and adjoining flooring. Maintain integrity of waterproof membranes where penetrated.
  4. Install individual traps for floor drains connected to sanitary building drain, unless otherwise indicated.
- N. Install roof drains at low points of roof areas according to roof membrane manufacturer's written installation instructions.
1. Install roof-drain flashing collar or flange so no leakage occurs between drain and adjoining roofing. Maintain integrity of waterproof membranes where penetrated.
  2. Position roof drains for easy access and maintenance.
- O. Install interceptors, including trapping, venting, and flow-control fitting, according to authorities having jurisdiction and with clear space for servicing.
1. Flush with In-Ground Installation: Set unit and extension, if required, with cover flush with finished grade.
  2. Install cleanout immediately downstream from interceptors not having integral cleanout on outlet.
- P. Fasten wall-hanging plumbing specialties securely to supports attached to building substrate if supports are specified and to building wall construction if no support is indicated.
- Q. Fasten recessed-type plumbing specialties to reinforcement built into walls.
- R. Install wood-blocking reinforcement for wall-mounting and recessed-type plumbing specialties.
- S. Install individual shutoff valve in each water supply to plumbing specialties. Use ball, gate, or globe valve if specific valve is not indicated. Install shutoff valves in accessible locations. Refer to Division 15 Section "Valves" for general-duty ball, butterfly, check, gate, and globe valves.
- T. Install escutcheons at wall, floor, and ceiling penetrations in exposed finished locations and within cabinets and millwork. Use deep-pattern escutcheons if required to conceal protruding pipe fittings.

### **3.2 CONNECTIONS**

- A. Piping installation requirements are specified in other Division 15 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Install piping adjacent to equipment to allow service and maintenance.
- C. Connect plumbing specialties to piping specified in other Division 15 Sections.
- D. Ground equipment.
- E. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.
- F. Connect plumbing specialties and devices that require power according to Division 16 Sections.
- G. Interceptor Connections: Connect piping, flow-control fittings, and accessories.
  - 1. Grease Interceptors: Connect inlet and outlet to unit, and flow-control fitting and vent to unit inlet piping.

### **3.3 FLASHING INSTALLATION**

- A. Fabricate flashing from single piece unless large pans, sumps, or other drainage shapes are required. Join flashing according to the following if required:
  - 1. Lead Sheets: Burn joints of lead sheets 6-lb/sq. ft. (30-kg/sq. m), 0.0938-inch (2.4-mm) thickness or thicker. Solder joints of lead sheets 4-lb/sq. ft. (20-kg/sq. m), 0.0625-inch (1.6-mm) thickness or thinner.
- B. Install sheet flashing on pipes, sleeves, and specialties passing through or embedded in floors and roofs with waterproof membrane.
  - 1. Pipe Flashing: Sleeve type, matching pipe size, with minimum length of 10 inches (250 mm), and skirt or flange extending at least 8 inches (200 mm) around pipe.
  - 2. Sleeve Flashing: Flat sheet, with skirt or flange extending at least 8 inches (200 mm) around sleeve.
  - 3. Embedded Specialty Flashing: Flat sheet, with skirt or flange extending at least 8 inches (200 mm) around specialty.
- C. Set flashing on floors and roofs in solid coating of bituminous cement.
- D. Secure flashing into sleeve and specialty clamping ring or device.
- E. Install flashing for piping passing through roofs with counterflashing or commercially made flashing fittings, according to Division 7 Section "Sheet Metal Flashing and Trim."

- F. Extend flashing up vent pipe passing through roofs and turn down into pipe, or secure flashing into cast-iron sleeve having calking recess.

### **3.4 FIELD QUALITY CONTROL**

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect field-assembled trap seal primer systems and their installation, including piping and electrical connections. Report results in writing.
  - 1. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
  - 2. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation. Remove malfunctioning units, replace with new units, and retest.
  - 3. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

### **3.5 PROTECTION**

- A. Protect drains during remainder of construction period to avoid clogging with dirt and debris and to prevent damage from traffic and construction work.
- B. Place plugs in ends of uncompleted piping at end of each day or when work stops.

**END OF SECTION**

**DIVISION 15485**  
**ELECTRIC, DOMESTIC WATER HEATERS**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. This Section includes the following for domestic water systems:
  - 1. Tankless, electric water heaters.
  - 2. Commercial, electric water heaters.
  - 3. Compression tanks.
  - 4. Accessories.

**1.3 SUBMITTALS**

- A. Product Data: For each type and size of water heater. Include rated capacities; shipping, installed, and operating weights; furnished specialties; and accessories.
- B. Shop Drawings: Detail water heater assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
  - 1. Wiring Diagrams: Power, signal, and control wiring. Differentiate between manufacturer-installed and field-installed wiring.
- C. Product Certificates: Signed by manufacturers of water heaters certifying that products furnished comply with requirements.
- D. Maintenance Data: For water heaters to include in maintenance manuals specified in Division 1.

**1.4 QUALITY ASSURANCE**

- A. Source Limitations: Obtain same type of water heaters through one source from a single manufacturer.
- B. Product Options: Drawings indicate size, profiles, and dimensional requirements of water heaters and are based on specific units indicated. Other manufacturers' products complying with requirements may be considered. Refer to Division 1 Section "Substitutions."

- C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- D. ASME Compliance: Fabricate and label water heater, hot-water storage tanks to comply with ASME Boiler and Pressure Vessel Code: Section VIII, "Pressure Vessels," Division 1.
- E. ASHRAE Standards: Comply with performance efficiencies prescribed for the following:
  - 1. ASHRAE 90.1, "Energy Efficient Design of New Buildings except Low-Rise Residential Buildings," for commercial water heaters.
  - 2. ASHRAE 90.2, "Energy Efficient Design of New Low-Rise Residential Buildings," for household water heaters.

## **1.5 WARRANTY**

- A. General Warranty: Special warranty specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

## **PART 2 - PRODUCTS**

### **2.1 MANUFACTURERS**

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Point-of-Use, Tankless, Electric Water Heaters:
    - a. Chronomite Laboratories, Inc.
    - b. Eemax
  - 2. Commercial, Point-of-Use, Storage, Electric Water Heaters:
    - a. Rheem
    - b. State Industries.
  - 3. Commercial, Storage, Electric Water Heaters:
    - a. Lochinvar Corp.
    - b. PVI Industries, Inc.
    - c. State Industries.
  - 4. Water Heater Stand and Drain Pan Units:

- a. Safety: W. H. Safety Products, Inc.
- 5. Compression Tanks:
  - a. Bell & Gossett
  - b. Taco, Inc.
  - c. Zurn Industries, Inc.; Wilkins Div.

## **2.2 POINT-OF-USE, TANKLESS, ELECTRIC WATER HEATERS**

- A. Description: Comply with UL 499.
- B. Construction: Without hot-water storage.
  - 1. Working-Pressure Rating: 150 psig (1035 kPa).
  - 2. Tappings: ASME B1.20.1, pipe thread.
  - 3. Interior Finish: Materials complying with NSF 61, barrier materials for potable-water tank linings.
  - 4. Jacket: Aluminum or steel, with enameled finish, or plastic.
- C. Heating System: Electric-resistance type.
  - 1. Temperature Control: Adjustable thermostat.
  - 2. Safety Control: Automatic, high-temperature-limit cutoff device or system.
- D. Mounting: Bracket or device for wall mounting.

## **2.3 COMMERCIAL, POINT-OF-USE, STORAGE, ELECTRIC WATER HEATERS (6 TO 40 GALLON)**

- A. Description: Comply with UL 174 or UL 1453, and listed by manufacturer for commercial applications.
- B. Storage Tank Construction: Non-ASME-code steel with 150-psig (1035-kPa) working-pressure rating.
  - 1. Tappings: Factory fabricated of materials compatible with tank for piping connections, relief valve, drain, anode rod, and controls as required. Attach tappings to tank before testing and labeling. Include ASME B1.20.1, pipe thread.
  - 2. Interior Finish: Materials and thicknesses complying with NSF 61, barrier materials for potable-water tank linings. Extend finish into and through tank fittings and outlets.
  - 3. Insulation: Comply with ASHRAE 90.1. Surround entire storage tank except connections and controls.
  - 4. Jacket: Steel, with enameled finish.
- C. Heating Elements: Two, unless otherwise indicated; electric, screw-in, immersion type.
  - 1. Temperature Control: Adjustable thermostat.

- D. Anode Rod: Factory installed, magnesium.
- E. Drain Valve: ASSE 1005, corrosion-resistant metal, factory installed.
- F. Special Requirement: NSF 5 construction.

## **2.4 COMMERCIAL, STORAGE, ELECTRIC WATER HEATERS (OVER 40 GALLONS)**

- A. Description: Comply with UL 1453.
- B. Storage Tank Construction: ASME-code steel with 150-psig (1035-kPa) working-pressure rating.
  - 1. Tappings: Factory fabricated of materials compatible with tank for piping connections, relief valve, pressure gage, thermometer, drain, anode rods, and controls as required. Attach tappings to tank shell before testing and labeling.
    - a. NPS 2 (DN50) and Smaller: Threaded ends according to ASME B1.20.1, pipe threads.
  - 2. Interior Finish: Materials and thicknesses complying with NSF 61, barrier materials for potable-water tank linings. Extend finish into and through tank fittings and outlets.
  - 3. Insulation: Comply with ASHRAE 90.1. Surround entire storage tank except connections and controls.
  - 4. Jacket: Steel, with enameled finish.
- C. Heating Elements: Electric, screw-in or bolt-on, immersion type arranged in multiples of three.
  - 1. Exception: Water heaters up to 9-kW input may have 2 or 3 elements.
  - 2. Staging: Input not exceeding 18 kW per step.
  - 3. Temperature Control: Adjustable surface-mounted thermostat.
  - 4. Safety Controls: Automatic, high-temperature-limit and low-water cutoff devices or systems.
- D. Drain Valve: ASSE 1005, corrosion-resistant metal, factory installed.
- E. Anode Rods: Factory installed, magnesium.
- F. Dip Tube: Factory installed. Not required if cold-water inlet is near bottom of storage tank.
- G. Special Requirement: NSF 5 construction.

## **2.5 COMPRESSION TANKS**

- A. Description: Steel, pressure-rated tank constructed with welded joints and factory-installed, butyl-rubber diaphragm. Include air precharge to minimum system-operating pressure at tank.
- B. Construction: 150-psig (1035-kPa) 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 thicknesses 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.

## **2.6 WATER HEATER ACCESSORIES**

- A. Combination Temperature and Pressure Relief Valves: ASME rated and stamped and complying with ASME PTC 25.3. Include relieving capacity at least as great as heat input and include pressure setting less than water heater working-pressure rating. Select relief valve with sensing element that extends into tank.
- B. Vacuum Relief Valves: Comply with ASME PTC 25.3. Furnish for installation in piping.
  - 1. Exception: Omit if water heater has integral vacuum-relieving device.
- C. Shock Absorbers: ASSE 1010 or PDI WH 201, Size A water hammer arrester.
- D. Water Heater Stands: Water heater manufacturer's factory-fabricated, steel stand for floor mounting and capable of supporting water heater and water. Include dimension that will support bottom of water heater a minimum of 18 inches (457 mm) above the floor.
- E. Water Heater Mounting Brackets: Water heater manufacturer's factory-fabricated, steel bracket for wall mounting and capable of supporting water heater and water.
- F. Drain Pans: Corrosion-resistant metal with raised edge. Include dimensions not less than base of water heater and include drain outlet not less than NPS 3/4 (DN20).

## **PART 3 - EXECUTION**

### **3.1 CONCRETE BASES**

- A. Install concrete bases of dimensions indicated. Refer to Division 3 and Division 15 Section "Basic Mechanical Materials and Methods."



### 3.2 WATER HEATER INSTALLATION

- A. Install commercial water heaters on concrete bases.
  - 1. Exception: Omit concrete bases for commercial water heaters if installation on stand, bracket, suspended platform, or direct on floor is indicated.
- B. Install water heaters, level and plumb, according to layout drawings, original design, and referenced standards. Maintain manufacturer's recommended clearances. Arrange units so controls and devices needing service are accessible.
- C. Install temperature and pressure relief valves in top portion of storage tanks. Use relief valves with sensing elements that extend into tanks. Extend relief valve outlet with water piping in continuous downward pitch and discharge onto closest floor drain.
- D. Install vacuum relief valves in cold-water-inlet piping.
- E. Install water heater drain piping as indirect waste to spill into open drains or over floor drains. Install hose-end drain valves at low points in water piping for water heaters that do not have tank drains. Refer to Division 15 Section "Plumbing Specialties" for drain valves.
- F. Install thermometers on water heater inlet and outlet piping
  - 1. Exception: Omit thermometers for the following:
    - a. Commercial, point-of-use, water heater inlet piping.
    - b. Water heater with thermometer outlet piping.
- G. Fill water heaters with water.

### 3.3 CONNECTIONS

- A. Piping installation requirements are specified in other Division 15 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Install piping adjacent to machine to allow service and maintenance.
- C. Connect hot- and cold-water piping with shutoff valves and unions. Connect hot-water-circulating piping with shutoff valve, check valve, and union.
- D. Make connections with dielectric fittings where piping is made of dissimilar metal.
- E. Electrical Connections: Power wiring and disconnect switches are specified in Division 16 Sections. Arrange wiring to allow unit service.
- F. Ground equipment.

1. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL Standards.

### **3.4 FIELD QUALITY CONTROL**

- A. In addition to manufacturer's written installation and startup checks, perform the following:
1. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
  2. Verify that piping system tests are complete.
  3. Check for piping connection leaks.
  4. Check for clear relief valve inlets, outlets, and drain piping.
  5. Check operation of circulators.
  6. Test operation of safety controls, relief valves, and devices.
  7. Energize electric circuits.
  8. Adjust operating controls.
  9. Adjust hot-water-outlet temperature settings. Do not set above 140 deg F (60 deg C) unless piping system application requires higher temperature.
  10. Balance water flow through manifolds of multiple-unit installations.

### **3.5 DEMONSTRATION**

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain water heaters.
1. Train Owner's maintenance personnel on procedures for starting and stopping, troubleshooting, servicing, and maintaining equipment.
  2. Review data in maintenance manuals. Refer to Division 1.
  3. Schedule training with Owner, through Architect, with at least seven days' advance notice.

**END OF SECTION**

**DIVISION 15815**  
**METAL DUCTS**

**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 rectangular, round, and flat-oval metal ducts and plenums for heating, ventilating, and air-conditioning systems in pressure classes from minus 2- to plus 10-inch wg (minus 500 to plus 2490 Pa).
- B. Related Sections include the following:
1. Division 15 Section "Duct Accessories" for dampers, sound-control devices, duct-mounted access doors and panels, turning vanes, and flexible ducts.
  2. Division 15 Section "Diffusers, Registers, and Grilles."
  3. Division 15 Section "Testing, Adjusting, and Balancing" for air balancing and final adjusting of manual-volume dampers.

**1.3 DEFINITIONS**

- A. Thermal Conductivity and Apparent Thermal Conductivity (k-Value): As defined in ASTM C 168. In this Section, these values are the result of the formula  $Btu \times in./h \times sq. \text{ ft.} \times deg \text{ F}$  or  $W/m \times K$  at the temperature differences specified. Values are expressed as Btu or W.

**1.4 SYSTEM DESCRIPTION**

- A. Duct system design, as indicated, has been used to select and size air-moving and -distribution equipment and other components of air system. Changes to layout or configuration of duct system must be specifically approved in writing by Architect.

**1.5 SUBMITTALS**

- A. Product Data: For duct liner and sealing materials.
- B. Shop Drawings: Show details of the following:
1. Duct layout indicating pressure classifications and sizes on plans.
  2. Fittings.
  3. Penetrations through fire-rated and other partitions.
- C. Coordination Drawings: Reflected ceiling plans drawn to scale and coordinating penetrations and ceiling-mounted items. Show the following:
1. Ceiling- and wall-mounted access doors and panels required to provide access to dampers and other operating devices.
  2. Coordination with ceiling-mounted items, including lighting fixtures, diffusers, grilles, speakers, sprinkler heads, access panels, and special moldings.
- D. Duct Construction Standards: Provide a copy of the duct construction standards to be used for each pressure classification in this project. Duct Construction Standards must

comply with the latest edition of SMACNA "HVAC Duct Construction Standards – Metal and Flexible."

- E. Field Test Reports: Indicate and interpret test results for compliance with performance requirements.
- F. Record Drawings: Indicate actual routing, fitting details, reinforcement, support, and installed accessories and devices.

## **1.6 QUALITY ASSURANCE**

- A. Welding Standards: Qualify welding procedures and welding personnel to perform welding processes for this Project according to AWS D1.1, "Structural Welding Code--Steel," for hangers and supports; AWS D1.2, "Structural Welding Code--Aluminum," for aluminum supporting members; and AWS D9.1, "Sheet Metal Welding Code," for duct joint and seam welding.
- B. Comply with NFPA 90A, "Installation of Air Conditioning and Ventilating Systems," unless otherwise indicated.
- C. Comply with NFPA 90B, "Installation of Warm Air Heating and Air Conditioning Systems," unless otherwise indicated.
- D. Comply with NFPA 96, "Ventilation Control and Fire Protection of Commercial Cooking Operations," Chapter 3, "Duct System," for range hood ducts, unless otherwise indicated.

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

- A. Deliver sealant and firestopping materials to site in original unopened containers or bundles with labels indicating manufacturer, product name and designation, color, expiration period for use, pot life, curing time, and mixing instructions for multicomponent materials.
- B. Store and handle sealant and firestopping materials according to manufacturer's written recommendations.
- C. Deliver and store stainless-steel sheets with mill-applied adhesive protective paper maintained through fabrication and installation
- D. Deliver and store all ductwork with protective material until installation. Any material left exposed to moisture and/or particulates shall be removed and replaced.
- E. Any installed ductwork or piping system left temporarily incomplete shall be covered with protective material until final connections can be installed.
- F. All ductwork and/or liner insulation to be wrapped with protective material until installation. Any ductwork or insulation left exposed to the environment or contaminating particulate matter shall be replaced at the contractor's expense.

## **PART 2 - PRODUCTS**

### **2.1 SHEET METAL MATERIALS**

- A. Galvanized, Sheet Steel: Lock-forming quality; ASTM A 653/A 653M, G90 (Z275) coating designation; mill-phosphatized finish for surfaces of ducts exposed to view.
- B. Carbon-Steel Sheets: ASTM A 366/A 366M, cold-rolled sheets; commercial quality; with oiled, exposed matte finish.

- C. **Stainless Steel:** ASTM A 480/A 480M, Type 316, sheet form with No. 4 finish for surfaces of ducts exposed to view; and Type 304, sheet form with No. 1 finish for concealed ducts.
- D. **Reinforcement Shapes and Plates:** Galvanized steel reinforcement where installed on galvanized, sheet metal ducts; compatible materials for aluminum and stainless-steel ducts.
- E. **Tie Rods:** Galvanized steel, 1/4-inch (6-mm) minimum diameter for 36-inch (900-mm) length or less; 3/8-inch (10-mm) minimum diameter for lengths longer than 36 inches (900 mm).

## **2.2 SEALANT MATERIALS**

- A. **Joint and Seam Sealants, General:** The term "sealant" is not limited to materials of adhesive or mastic nature but includes tapes and combinations of open-weave fabric strips and mastics.
  - 1. **Joint and Seam Sealant:** One-part, nonsag, solvent-release-curing, polymerized butyl sealant, formulated with a minimum of 75 percent solids.
  - 2. **Flanged Joint Mastics:** One-part, acid-curing, silicone, elastomeric joint sealants, complying with ASTM C 920, Type S, Grade NS, Class 25, Use O.

## **2.3 HANGERS AND SUPPORTS**

- A. **Hanger Materials:** Galvanized, sheet steel or round, threaded steel rod.
  - 1. **Hangers Installed in Corrosive Atmospheres:** Electrogalvanized, all-thread rod or galvanized rods with threads painted after installation.
  - 2. **Straps and Rod Sizes:** Comply with latest edition of SMACNA's "HVAC Duct Construction Standards--Metal and Flexible" for sheet steel width and thickness and for steel rod diameters.
- B. **Duct Attachments:** Sheet metal screws, blind rivets, or self-tapping metal screws; compatible with duct materials.
- C. **Trapeze and Riser Supports:** Steel shapes complying with ASTM A 36/A 36M.
  - 1. **Supports for Galvanized-Steel Ducts:** Galvanized steel shapes and plates.
  - 2. **Supports for Stainless-Steel Ducts:** Stainless-steel support materials.
  - 3. **Supports for Aluminum Ducts:** Aluminum support materials, unless materials are electrolytically separated from ductwork.

## **2.4 RECTANGULAR DUCT FABRICATION**

- A. **General:** Fabricate ducts, elbows, transitions, offsets, branch connections, and other construction with galvanized, sheet steel, according to the latest edition of SMACNA's "HVAC Duct Construction Standards--Metal and Flexible." Comply with requirements for metal thickness, reinforcing types and intervals, tie-rod applications, and joint types and intervals.
  - 1. **Lengths:** Fabricate rectangular ducts in lengths appropriate to reinforcement and rigidity class required for pressure classification.
  - 2. **Materials:** Free from visual imperfections such as pitting, seam marks, roller marks, stains, and discolorations.

- B. Fabricate range hood exhaust ducts with 0.0598-inch- (1.5-mm-) thick, galvanized sheet for concealed ducts and 0.0500-inch- (1.3-mm-) thick stainless steel for exposed ducts. Weld and flange seams and joints. Comply with NFPA 96.
- C. Fabricate dishwasher hood exhaust ducts with 0.0500-inch- (1.3-mm-) thick stainless steel. Weld and flange seams and joints.
- D. Static-Pressure Classifications: Unless otherwise indicated, construct ducts to the following:
  - 1. Supply Ducts between AHU and Air Terminal Units: 3-inch wg (750 Pa).
  - 2. Supply Ducts after air terminal units and on constant volume supply equipment: 1-inch wg (250 Pa), positive pressure
  - 3. Return Ducts: 1-inch wg (500 Pa), negative pressure.
  - 4. Exhaust Ducts: 1-inch wg (500 Pa), negative pressure.
- E. Cross Breaking or Cross Beading: Cross break or cross bead duct sides 19 inches (480 mm) and larger and 0.0359 inch (0.9 mm) thick or less, with more than 10 sq. ft. (0.93 sq. m) of unbraced panel area, unless ducts are lined.

## **2.5 ROUND FABRICATION**

- A. Round Ducts: Fabricate spiral seam supply and return ducts of galvanized steel according to SMACNA's "HVAC Duct Construction Standards--Metal and Flexible." Snap Lock Longitudinal seam ductwork will not be allowed. Adjustable elbows will not be allowed.
- B. Spiral seam round or oval duct may be substituted for rectangular duct at the contractors option. Spiral seam ductwork sizing must result in the same or less pressure drop than the rectangular duct indicated on the plans.

## **PART 3 - EXECUTION**

### **3.1 DUCT INSTALLATION, GENERAL**

- A. Duct installation requirements are specified in other Division 15 Sections. Drawings indicate general arrangement of ducts, fittings, and accessories.
- B. Construct and install each duct system for the specific duct pressure classification indicated.
- C. Install round ducts in lengths not less than 10 feet (3 m), unless interrupted by fittings.
- D. Install ducts with fewest possible joints.
- E. Install fabricated fittings for changes in directions, changes in size and shape, and connections.
- F. Install couplings tight to duct wall surface with a minimum of projections into duct.
- G. Install ducts, unless otherwise indicated, vertically and horizontally, parallel and perpendicular to building lines; avoid diagonal runs.
- H. Install ducts close to walls, overhead construction, columns, and other structural and permanent enclosure elements of building.

- I. Install ducts with a clearance of 1 inch (25 mm), plus allowance for insulation thickness.
- J. Conceal ducts from view in finished spaces. Do not encase horizontal runs in solid partitions, unless specifically indicated.
- K. Coordinate layout with suspended ceiling, fire- and smoke-control dampers, lighting layouts, and similar finished work.
- L. Electrical Equipment Spaces: Route ductwork to avoid passing through transformer vaults and electrical equipment spaces and enclosures.
- M. Non-Fire-Rated Partition Penetrations: Where ducts pass through interior partitions and exterior walls, and are exposed to view, conceal space between construction opening and duct or duct insulation with sheet metal flanges of same metal thickness as duct. Overlap opening on four sides by at least 1-1/2 inches (38 mm).
- N. Fire-Rated Partition Penetrations: Where ducts pass through interior partitions and exterior walls, install appropriately rated fire damper, sleeve, and firestopping sealant. Fire and smoke dampers are specified in Division 15 Section "Duct Accessories." Firestopping materials and installation methods are specified in Division 7 Sections.

### **3.2 RANGE HOOD EXHAUST DUCT INSTALLATIONS**

- A. Install ducts to allow for thermal expansion of ductwork through 2000 deg F (1100 deg C) temperature range.
- B. Install ducts without dips or traps that may collect residues, unless traps have continuous or automatic residue removal.
- C. Install access openings at each change in direction and at 15-foot (4.6-m) intervals; locate on sides of duct a minimum of 1-1/2 inches (38 mm) from bottom; and fit with grease-tight covers of same material as duct.
- D. Do not penetrate fire-rated assemblies.

### **3.3 DISHWASHER EXHAUST DUCT INSTALLATIONS**

- A. Install dishwasher exhaust ducts according to SMACNA's "HVAC Duct Construction Standards--Metal and Flexible."

### **3.4 SEAM AND JOINT SEALING**

- A. General: Seal duct seams and joints according to the duct pressure class indicated and as described in SMACNA's "HVAC Duct Construction Standards--Metal and Flexible." All duct to be sealed to SMACNA seal class A which requires sealing all tranverse joints, longitudinal seams and duct wall penetratrtions regardless of pressure classification.
- B. Seal externally insulated ducts before insulation installation.
- C. All ducts shall be inspected after sealing is complete and prior to insulation installation. Provide the engineer with a minimum 7 days notice prior to beginning duct insulation.

### **3.5 HANGING AND SUPPORTING**

- A. Install rigid round and rectangular metal duct with support systems indicated in the latest edition of SMACNA's "HVAC Duct Construction Standards--Metal and Flexible."

- B. Support horizontal ducts within 24 inches (600 mm) of each elbow and within 48 inches (1200 mm) of each branch intersection.
- C. Support vertical ducts at a maximum interval of 16 feet (5 m) and at each floor.
- D. Install upper attachments to structures with an allowable load not exceeding one-fourth of failure (proof-test) load.

### **3.6 CONNECTIONS**

- A. Connect equipment with flexible connectors according to Division 15 Section "Duct Accessories."
- B. For branch, outlet and inlet, and terminal unit connections, comply with the latest edition of SMACNA's "HVAC Duct Construction Standards--Metal and Flexible."

### **3.7 FIELD QUALITY CONTROL**

- A. Disassemble, reassemble, and seal segments of systems as required to accommodate leakage testing and as required for compliance with test requirements.
- B. 25% of the duct installed after the air handling units and prior to the air terminal units shall be tested in the presence of the Architect, at static pressures equal to maximum design pressure of system or section being tested. The sections of duct to be tested shall be chosen by the architect or engineer after installation of the duct. If pressure classifications are not indicated, test entire system at maximum system design pressure. Do not pressurize systems above maximum design operating pressure. Give seven days' advance notice for testing.
- C. Leakage Test: Perform tests according to SMACNA's "HVAC Air Duct Leakage Test Manual."
- D. Maximum Allowable Leakage: Comply with requirements for Leakage Classification 3 for round, Leakage Classification 12 for rectangular ducts in pressure classifications less than and equal to 2-inch wg (500 Pa) (both positive and negative pressures), and Leakage Classification 6 for pressure classifications from 2- to 10-inch wg (500 to 2490 Pa).
- E. Remake leaking joints and retest until leakage is less than maximum allowable.

### **3.8 CLEANING**

- A. After completing system installation, including outlet fittings and devices, inspect the system. Vacuum ducts before final acceptance to remove dust and debris.

**END OF SECTION**



**DIVISION 15820**  
**DUCT ACCESSORIES**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. This Section includes the following:
1. Backdraft dampers.
  2. Manual-volume dampers.
  3. Fire dampers.
  4. Turning vanes.
  5. Duct-mounted access doors and panels.
  6. Flexible ducts.
  7. Flexible connectors.
  8. Duct accessory hardware.
- B. Related Sections include the following:
1. Division 8 Sections for wall- and ceiling-mounted access doors and panels.
  2. Division 10 Sections for intake and relief louvers and vents connected to ducts and installed in exterior walls.
  3. Division 15 Section "Diffusers, Registers, and Grilles."
  4. Division 16 Sections for duct-mounted fire and smoke detectors.

**1.3 SUBMITTALS**

- A. Product Data: For the following:
1. Backdraft dampers.
  2. Manual-volume dampers.
  3. Fire dampers.
  4. Duct-mounted access doors and panels.
  5. Flexible ducts.
- B. Shop Drawings: Detail equipment assemblies and indicate dimensions, weights, loadings, required clearances, method of field assembly, components, location, and size of each field connection. Detail the following:

1. Special fittings and manual- and automatic-volume-damper installations.
  2. Fire-damper installations, including sleeves and duct-mounted access doors and panels.
- C. Product Certificates: Submit certified test data on dynamic insertion loss; self-noise power levels; and airflow performance data, static-pressure loss, dimensions, and weights.

#### **1.4 QUALITY ASSURANCE**

- A. NFPA Compliance: Comply with the following NFPA standards:
1. NFPA 90A, "Installation of Air Conditioning and Ventilating Systems."
  2. NFPA 90B, "Installation of Warm Air Heating and Air Conditioning Systems."

#### **1.5 EXTRA MATERIALS**

- A. Furnish extra materials described below that match products installed, are packaged with protective covering for storage, and are identified with labels describing contents.
1. Fusible Links: Furnish quantity equal to 10 percent of amount installed.

### **PART 2 - PRODUCTS**

#### **2.1 SHEET METAL MATERIALS**

- A. Galvanized, Sheet Steel: Lock-forming quality; ASTM A 653/A 653M, G90 (Z275) coating designation; mill-phosphatized finish for surfaces of ducts exposed to view.
- B. Carbon-Steel Sheets: ASTM A 366/A 366M, cold-rolled sheets, commercial quality, with oiled, exposed matte finish.
- C. Reinforcement Shapes and Plates: Galvanized steel reinforcement where installed on galvanized, sheet metal ducts; compatible materials for aluminum and stainless-steel ducts.
- D. Tie Rods: Galvanized steel, 1/4-inch (6-mm) minimum diameter for 36-inch (900-mm) length or less; 3/8-inch (10-mm) minimum diameter for lengths longer than 36 inches (900 mm).

#### **2.2 BACKDRAFT DAMPERS**

- A. Description: Suitable for horizontal or vertical installations.
- B. Frame: 0.052-inch- (1.3-mm-) thick, galvanized, sheet steel, with welded corners and mounting flange.

- C. Blades: 0.025-inch- (0.6-mm-) thick, roll-formed aluminum.
- D. Blade Seals: Vinyl.
- E. Blade Axles: Galvanized steel.
- F. Tie Bars and Brackets: Galvanized steel.
- G. Return Spring: Adjustable tension.

## **2.3 MANUAL-VOLUME DAMPERS**

- A. General: Factory fabricated with required hardware and accessories. Stiffen damper blades for stability. Include locking device to hold single-blade dampers in a fixed position without vibration. Close duct penetrations for damper components to seal duct consistent with pressure class.
- B. Standard Volume Dampers: Multiple- or single-blade, parallel- or opposed-blade design as indicated, standard leakage rating, with linkage outside airstream, and suitable for horizontal or vertical applications.
  - 1. Steel Frames: Hat-shaped, galvanized, sheet steel channels, minimum of 0.064 inch (1.62 mm) thick, with mitered and welded corners; frames with flanges where indicated for attaching to walls; and flangeless frames where indicated for installing in ducts.
  - 2. Roll-Formed Steel Blades: 0.064-inch- (1.62-mm-) thick, galvanized, sheet steel.
  - 3. Blade Axles: Galvanized steel.
  - 4. Tie Bars and Brackets: Galvanized steel.
- C. Jackshaft: 1-inch- (25-mm-) diameter, galvanized steel pipe rotating within a pipe-bearing assembly mounted on supports at each mullion and at each end of multiple-damper assemblies.
  - 1. Length and Number of Mountings: Appropriate to connect linkage of each damper of a multiple-damper assembly.
- D. Damper Hardware: Zinc-plated, die-cast core with dial and handle made of 3/32-inch- (2.4-mm-) thick zinc-plated steel, and a 3/4-inch (19-mm) hexagon locking nut. Include center hole to suit damper operating-rod size. Include elevated platform for insulated duct mounting.

## **2.4 FIRE DAMPERS**

- A. General: Labeled to UL 555.
- B. Fire Rating: One and one-half hours.
- C. Fire Rating: One and one-half hours.

- D. Frame: SMACNA Type B with blades out of airstream; fabricated with roll-formed, 0.034-inch- (0.85-mm-) thick galvanized steel; with mitered and interlocking corners.
- E. Mounting Sleeve: Factory- or field-installed galvanized, sheet steel.
  - 1. Minimum Thickness: 0.052 inch (1.3 mm) or 0.138 inch (3.5 mm) thick as indicated, and length to suit application.
  - 2. Exceptions: Omit sleeve where damper frame width permits direct attachment of perimeter mounting angles on each side of wall or floor, and thickness of damper frame complies with sleeve requirements.
- F. Mounting Orientation: Vertical or horizontal as indicated.
- G. Blades: Roll-formed, interlocking, 0.034-inch- (0.85-mm-) thick, galvanized, sheet steel. In place of interlocking blades, use full-length, 0.034-inch- (0.85-mm-) thick, galvanized steel blade connectors.
- H. Horizontal Dampers: Include a blade lock and stainless-steel negator closure spring.
- I. Fusible Link: Replaceable, 165 deg F (74 deg C) rated as indicated.

## **2.5 TURNING VANES**

- A. Fabricate to comply with SMACNA's "HVAC Duct Construction Standards--Metal and Flexible."
- B. Acoustic Turning Vanes: Fabricate of airfoil-shaped aluminum extrusions with perforated faces and fibrous-glass fill.

## **2.6 DUCT-MOUNTED ACCESS DOORS AND PANELS**

- A. General: Fabricate doors and panels airtight and suitable for duct pressure class.
- B. Frame: Galvanized, sheet steel, with bend-over tabs and foam gaskets.
- C. Door: Double-wall, galvanized, sheet metal construction with insulation fill and thickness, and number of hinges and locks as indicated for duct pressure class. Include vision panel where indicated. Include 1-by-1-inch (25-by-25-mm) butt or piano hinge and cam latches.
- D. Seal around frame attachment to duct and door to frame with neoprene or foam rubber.
- E. Insulation: 1-inch- (25-mm-) thick, fibrous-glass or polystyrene-foam board.

## **2.7 FLEXIBLE CONNECTORS**

- A. General: Flame-retarded or noncombustible fabrics, coatings, and adhesives complying with UL 181, Class 1.

- B. Standard Metal-Edged Connectors: Factory fabricated with a strip of fabric 3-1/2 inches (89 mm) wide attached to two strips of 2-3/4-inch- (70-mm-) wide, 0.028-inch- (0.7-mm-) thick, galvanized, sheet steel or 0.032-inch (0.8-mm) aluminum sheets. Select metal compatible with connected ducts.
- C. Extra-Wide Metal-Edged Connectors: Factory fabricated with a strip of fabric 5-3/4 inches (146 mm) wide attached to two strips of 2-3/4-inch- (70-mm-) wide, 0.028-inch- (0.7-mm-) thick, galvanized, sheet steel or 0.032-inch (0.8-mm) aluminum sheets. Select metal compatible with connected ducts.
- D. Transverse Metal-Edged Connectors: Factory fabricated with a strip of fabric 3-1/2 inches (89 mm) wide attached to two strips of 4-3/8-inch- (111-mm-) wide, 0.028-inch- (0.7-mm-) thick, galvanized, sheet steel or 0.032-inch (0.8-mm) aluminum sheets. Select metal compatible with connected ducts.
- E. Conventional, Indoor System Flexible Connector Fabric: Glass fabric double coated with polychloroprene.
  - 1. Minimum Weight: 26 oz./sq. yd. (880 g/sq. m).
  - 2. Tensile Strength: 480 lbf/inch (84 N/mm) in the warp, and 360 lbf/inch (63 N/mm) in the filling.
- F. Conventional, Outdoor System Flexible Connector Fabric: Glass fabric double coated with a synthetic-rubber, weatherproof coating resistant to the sun's ultraviolet rays and ozone environment.
  - 1. Minimum Weight: 26 oz./sq. yd. (880 g/sq. m).
  - 2. Tensile Strength: 530 lbf/inch (93 N/mm) in the warp, and 440 lbf/inch (77 N/mm) in the filling.

## 2.8 FLEXIBLE DUCTS

- A. General: Comply with UL 181, Class 1.
- B. Flexible Ducts, Insulated: Factory-fabricated, insulated, round duct, with an outer jacket enclosing 1-1/2-inch- (38-mm-) thick, glass-fiber insulation around a continuous inner liner.
  - 1. Reinforcement: Steel-wire helix encapsulated in inner liner.
  - 2. Outer Jacket: Polyethylene film.
  - 3. Inner Liner: Polyethylene film.
- C. Pressure Rating: 6-inch wg (1500 Pa) positive, 1/2-inch wg (125 Pa) negative.

## 2.9 ACCESSORY HARDWARE

- A. Instrument Test Holes: Cast iron or cast aluminum to suit duct material, including screw cap and gasket. Size to allow insertion of pitot tube and other testing instruments, and length to suit duct insulation thickness.
- B. Splitter Damper Accessories: Zinc-plated damper blade bracket; 1/4-inch (6-mm), zinc-plated operating rod; and a duct-mounted, ball-joint bracket with flat rubber gasket and square-head set screw.
- C. Flexible Duct Clamps: Stainless-steel band with cadmium-plated hex screw to tighten band with a worm-gear action, in sizes 3 to 18 inches (75 to 450 mm) to suit duct size.
- D. Adhesives: High strength, quick setting, neoprene based, waterproof, and resistant to gasoline and grease.

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION**

- A. Install duct accessories according to applicable details shown in SMACNA's "HVAC Duct Construction Standards--Metal and Flexible" for metal ducts and NAIMA's "Fibrous Glass Duct Construction Standards" for fibrous-glass ducts.
- B. Install volume dampers in lined duct; avoid damage to and erosion of duct liner.
- C. Provide test holes at fan inlet and outlet and elsewhere as indicated.
- D. Install fire and smoke dampers according to manufacturer's UL-approved written instructions.
  - 1. Install fusible links in fire dampers.
- E. Install duct access panels for access to both sides of duct coils. Install duct access panels downstream from volume dampers, fire dampers, turning vanes, and equipment.
  - 1. Install duct access panels to allow access to interior of ducts for cleaning, inspecting, adjusting, and maintaining accessories and terminal units.
  - 2. Install access panels on side of duct where adequate clearance is available.
- F. Label access doors according to Division 15 Section "Mechanical Identification."

### **3.2 ADJUSTING**

- A. Adjust duct accessories for proper settings.
- B. Adjust fire dampers for proper action.

- C. Final positioning of manual-volume dampers is specified in Division 15 Section "Testing, Adjusting, and Balancing."

**END OF SECTION**

**DIVISION 15837**  
**CENTRIFUGAL FANS**

**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 centrifugal fans and vent sets.

**1.3 PERFORMANCE REQUIREMENTS**

- A. Project Altitude: Base air ratings on actual site elevations.
- B. Operating Limits: Classify according to AMCA standards.

**1.4 SUBMITTALS**

- A. Product Data: Include rated capacities, furnished specialties, and accessories for each unit scheduled and include the following:
  - 1. Certified fan performance curves with system operating conditions indicated.
  - 2. Certified fan sound-power ratings.
  - 3. Motor ratings and electrical characteristics, plus motor and electrical accessories.
  - 4. Material gages and finishes, including color charts.
  - 5. Dampers, including housings, linkages, and operators.
- B. Shop Drawings: Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
  - 1. Wiring Diagrams: Power, signal, and control wiring. Differentiate between manufacturer-installed and field-installed wiring.
- C. Maintenance Data: For centrifugal fans to include in maintenance manuals specified in Division 1.

**1.5 QUALITY ASSURANCE**

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.



- B. AMCA Compliance: Products shall comply with performance requirements and shall be licensed to use the AMCA-Certified Ratings Seal.
- C. NEMA Compliance: Motors and electrical accessories shall comply with NEMA standards.

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

- A. Deliver fans as factory-assembled units, to the extent allowable by shipping limitations, with protective crating and covering.
- B. Disassemble and reassemble units, as required for moving to the final location, according to manufacturer's written instructions.
- C. Lift and support units with manufacturer's designated lifting or supporting points.

#### **1.7 COORDINATION**

- A. Coordinate size and location of structural support members and/or shaft locations.
- B. Coordinate installation of roof curbs, equipment supports, and roof penetrations. These items are specified in Division 7.

#### **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. Belts: One set for each belt-driven unit.

### **PART 2 - PRODUCTS**

#### **2.1 MANUFACTURERS**

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Cook, Loren Company.
  - 2. Greenheck.

#### **2.2 HOUSINGS**

- A. Roof Mounted Centrifugal Exhaust Fan.
  - 1. The fan shall be of bolted and welded construction utilizing corrosion resistant fasteners. The spun aluminum structural components shall be constructed of minimum 16 gauge marine alloy aluminum, bolted to a rigid aluminum support structure. The aluminum base shall have continuously welded curb cap corners

for maximum leak protection. The discharge baffle shall have a rolled bead for added strength. An integral conduit chase shall be provided through the curb cap and into the motor compartment to facilitate wiring connections. Bearings and drives shall be mounted on a minimum 14 gauge steel power assembly, isolated from the unit structure with rubber vibration isolators. These components shall be enclosed in a weather-tight compartment, separated from the exhaust airstream. Unit shall bear an engraved aluminum nameplate and shall be shipped in ISTA certified transit tested packaging.

## **2.3 WHEELS**

- A. Roof Mounted Centrifugal Exhaust Fan
  - 1. Wheel shall be centrifugal backward inclined, constructed of 100% aluminum, including a precision machined cast aluminum hub. Wheel inlet shall overlap an aerodynamic aluminum inlet cone to provide maximum performance and efficiency. Wheel shall be balanced in accordance with AMCA Standard 204-96, Balance Quality and Vibration Levels for Fans.

## **2.4 SHAFTS**

- A. Statically and dynamically balanced and selected for continuous operation at maximum rated fan speed and motor horsepower, with final alignment and belt adjustment made after installation.
- B. Turned, ground, and polished hot-rolled steel with keyway. Ship with a protective coating of lubricating oil.
- C. Designed to operate at no more than 70 percent of first critical speed at top of fan's speed range.

## **2.5 BEARINGS**

- A. Prelubricated and Sealed Shaft Bearings: Self-aligning, pillow-block-type ball bearings.
  - 1. Ball-Bearing Rating Life: ABMA 9, L<sub>50</sub> of 200,000 hours.
  - 2. Roller-Bearing Rating Life: ABMA 11, L<sub>50</sub> of 200,000 hours.

## **2.6 BELT DRIVES**

- A. Description: Factory mounted, with final alignment and belt adjustment made after installation.
  - 1. Service Factor Based on Fan Motor: 1.5.
- B. Fan Pulleys: Cast iron or cast steel with split, tapered bushing; dynamically balanced at factory.

- C. Motor Pulleys: Adjustable pitch for use with motors through 5 hp; fixed pitch for use with motors larger than 5 hp. Select pulley so pitch adjustment is at the middle of adjustment range at fan design conditions.
- D. Belts: Oil resistant, nonsparking, and nonstatic; matched sets for multiple belt drives.
- E. Motor Mount: Adjustable for belt tensioning.

## **2.7 ACCESSORIES**

- A. Scroll Access Doors: Shaped to conform to scroll, with quick-opening latches and gaskets.
- B. Companion Flanges: Galvanized steel, for duct connections.
- C. Scroll Drain Connection: NPS 1 (DN 25) steel pipe coupling welded to low point of fan scroll.
- D. Shaft Cooler: Metal disk between bearings and fan wheel, designed to dissipate heat from shaft.
- E. Spark-Resistant Construction: AMCA 99 (where required).
- F. Shaft Seals: Airtight seals installed around shaft on drive side of single-width fans.
- G. Weather Cover: Enameled-steel sheet with ventilation slots, bolted to housing.

## **2.8 MOTORS**

- A. Refer to Division 15 Section "Motors" for general requirements for factory-installed motors.
- B. Motor Construction: NEMA MG 1, general purpose, continuous duty, high efficiency, Design B.
- C. Enclosure Type: [Open dripproof] [Totally enclosed, fan cooled].

## **2.9 SOURCE QUALITY CONTROL**

- A. Sound-Power Level Ratings: Comply with AMCA 301, "Methods for Calculating Fan Sound Ratings from Laboratory Test Data." Factory test fans according to AMCA 300, "Reverberant Room Method for Sound Testing of Fans." Label fans with the AMCA-Certified Ratings Seal.
- B. Fan Performance Ratings: Establish flow rate, pressure, power, air density, speed of rotation, and efficiency by factory tests and ratings according to AMCA 210, "Laboratory Methods of Testing Fans for Rating."

## **PART 3 - EXECUTION**

### 3.1 INSTALLATION

- A. Install centrifugal fans level and plumb.
- B. Install units with clearances for service and maintenance.
- C. Label fans according to requirements specified in Division 15 Section "Mechanical Identification."

### 3.2 CONNECTIONS

- A. Duct installation and connection requirements are specified in other Division 15 Sections. Drawings indicate general arrangement of ducts and duct accessories. Make final duct connections with flexible connectors. Flexible connectors are specified in Division 15 Section "Duct Accessories."
- B. Install ducts adjacent to fans to allow service and maintenance.
- C. Ground equipment.
- D. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

### 3.3 FIELD QUALITY CONTROL

- A. Equipment Startup Checks:
  - 1. Verify that shipping, blocking, and bracing are removed.
  - 2. Verify that unit is secure on mountings and supporting devices and that connections to ducts and electrical components are complete. Verify that proper thermal-overload protection is installed in motors, starters, and disconnect switches.
  - 3. Verify that cleaning and adjusting are complete.
  - 4. Disconnect fan drive from motor, verify proper motor rotation direction, and verify fan wheel free rotation and smooth bearing operation. Reconnect fan drive system, align and adjust belts, and install belt guards.
  - 5. Verify lubrication for bearings and other moving parts.
- B. Starting Procedures:
  - 1. Energize motor and adjust fan to indicated rpm.
  - 2. Measure and record motor voltage and amperage.
- C. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation. Remove malfunctioning units, replace with new units, and retest.
- D. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

- E. Shut unit down and reconnect automatic temperature-control operators.
- F. Refer to Division 15 Section "Testing, Adjusting, and Balancing" for testing, adjusting, and balancing procedures.
- G. Replace fan and motor pulleys as required to achieve design airflow.
- H. Repair or replace malfunctioning units. Retest as specified above after repairs or replacements are made.

### **3.4 ADJUSTING**

- A. Adjust damper linkages for proper damper operation.
- B. Adjust belt tension.
- C. Lubricate bearings.

### **3.5 CLEANING**

- A. On completion of installation, internally clean fans according to manufacturer's written instructions. Remove foreign material and construction debris. Vacuum fan wheel and cabinet.
- B. After completing system installation, including outlet fitting and devices, inspect exposed finish. Remove burrs, dirt, and construction debris and repair damaged finishes.

### **3.6 DEMONSTRATION**

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain centrifugal fans.
  - 1. Train Owner's maintenance personnel on procedures and schedules for starting and stopping, troubleshooting, servicing, and maintaining equipment and schedules.
  - 2. Review data in maintenance manuals. Refer to Division 1 Section "Closeout Procedures."
  - 3. Schedule training with Owner, through Architect, with at least seven days' advance notice.

**END OF SECTION**

**DIVISION 15855**  
**DIFFUSERS, REGISTERS, AND GRILLES**

**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 ceiling- and wall-mounted diffusers, registers, and grilles.
- B. Related Sections include the following:
  - 1. Division 10 Sections for fixed and adjustable louvers and wall vents, whether or not they are connected to ducts.
  - 2. Division 15 Section "Duct Accessories" for fire and smoke dampers and volume-control dampers not integral to diffusers, registers, and grilles.
  - 3. Division 15 Section "Testing, Adjusting, and Balancing" for balancing diffusers, registers, and grilles.

**1.3 DEFINITIONS**

- A. Diffuser: Circular, square, or rectangular air distribution outlet, generally located in the ceiling and comprised of deflecting members discharging supply air in various directions and planes and arranged to promote mixing of primary air with secondary room air.
- B. Grille: A louvered or perforated covering for an opening in an air passage, which can be located in a sidewall, ceiling, or floor.
- C. Register: A combination grille and damper assembly over an air opening.

**1.4 SUBMITTALS**

- A. Product Data: For each model indicated, include the following:
  - 1. Data Sheet: For each type of air outlet and inlet, and accessory furnished; indicate construction, finish, and mounting details.
  - 2. Performance Data: Include throw and drop, static-pressure drop, and noise ratings for each type of air outlet and inlet.
  - 3. Schedule of diffusers, registers, and grilles indicating drawing designation, room location, quantity, model number, size, and accessories furnished.

4. Assembly Drawing: For each type of air outlet and inlet; indicate materials and methods of assembly of components.
- B. Coordination Drawings: Reflected ceiling plans and wall elevations drawn to scale to show locations and coordination of diffusers, registers, and grilles with other items installed in ceilings and walls.

## **1.5 QUALITY ASSURANCE**

- A. NFPA Compliance: Install diffusers, registers, and grilles according to NFPA 90A, "Standard for the Installation of Air-Conditioning and Ventilating Systems."

## **PART 2 - PRODUCTS**

### **2.1 MANUFACTURED UNITS**

- A. Diffusers, registers, and grilles are scheduled on Drawings.
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Titus.
  2. Price

### **2.2 SOURCE QUALITY CONTROL**

- A. Testing: Test performance according to ASHRAE 70, "Method of Testing for Rating the Performance of Air Outlets and Inlets."

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Examine areas where diffusers, registers, and grilles are to be installed for compliance with requirements for installation tolerances and other conditions affecting performance of equipment. Do not proceed with installation until unsatisfactory conditions have been corrected.

### **3.2 INSTALLATION**

- A. Install diffusers, registers, and grilles level and plumb, according to manufacturer's written instructions, Coordination Drawings, original design, and referenced standards.

- B. Ceiling-Mounted Outlets and Inlets: Drawings indicate general arrangement of ducts, fittings, and accessories. Air outlet and inlet locations have been indicated to achieve design requirements for air volume, noise criteria, airflow pattern, throw, and pressure drop. Make final locations where indicated, as much as practicable. . Coordinate device locations with ceiling grid, sprinklers, and lights. Where architectural features or other items conflict with installation, notify Architect for a determination of final location.
- C. Install diffusers, registers, and grilles with airtight connection to ducts and to allow service and maintenance of dampers, air extractors, and fire dampers.

### **3.3 ADJUSTING**

- A. After installation, adjust diffusers, registers, and grilles to air patterns indicated, or as directed, before starting air balancing.

### **3.4 CLEANING**

- A. After installation of diffusers, registers, and grilles, inspect exposed finish. Clean exposed surfaces to remove burrs, dirt, and smudges. Replace diffusers, registers, and grilles that have damaged finishes.

**END OF SECTION**



**DIVISION 15990**  
**TESTING, ADJUSTING, AND BALANCING**

**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 testing, adjusting, and balancing HVAC systems to produce design objectives, including the following:
  - 1. Balancing airflow flow within distribution systems, including submains, branches, and terminals, to indicated quantities according to specified tolerances.
  - 2. Adjusting total HVAC systems to provide indicated quantities.
  - 3. Measuring electrical performance of HVAC equipment.
  - 4. Setting quantitative performance of HVAC equipment.
  - 5. Verifying that automatic control devices are functioning properly.
  - 6. Reporting results of the activities and procedures specified in this Section.
- B. Related Sections include the following:
  - 1. Testing and adjusting requirements unique to particular systems and equipment are included in the Sections that specify those systems and equipment.
  - 2. Field quality-control testing to verify that workmanship quality for system and equipment installation is specified in system and equipment Sections.

**1.3 DEFINITIONS**

- A. Adjust: To regulate fluid flow rate and air patterns at the terminal equipment, such as to reduce fan speed or adjust a damper.
- B. Balance: To proportion flows within the distribution system, including submains, branches, and terminals, according to design quantities.
- C. Draft: A current of air, when referring to localized effect caused by one or more factors of high air velocity, low ambient temperature, or direction of airflow, whereby more heat is withdrawn from a person's skin than is normally dissipated.
- D. Procedure: An approach to and execution of a sequence of work operations to yield repeatable results.
- E. Report Forms: Test data sheets for recording test data in logical order.
- F. Static Head: The pressure due to the weight of the fluid above the point of measurement. In a closed system, static head is equal on both sides of the pump.

- G. Suction Head: The height of fluid surface above the centerline of the pump on the suction side.
- H. System Effect: A phenomenon that can create undesired or unpredicted conditions that cause reduced capacities in all or part of a system.
- I. System Effect Factors: Allowances used to calculate a reduction of the performance ratings of a fan when installed under conditions different from those presented when the fan was performance tested.
- J. Terminal: A point where the controlled medium, such as fluid or energy, enters or leaves the distribution system.
- K. Test: A procedure to determine quantitative performance of a system or equipment.
- L. Testing, Adjusting, and Balancing Agent: The entity responsible for performing and reporting the testing, adjusting, and balancing procedures.
- M. AABC: Associated Air Balance Council.
- N. CTI: Cooling Tower Institute.
- O. NEBB: National Environmental Balancing Bureau.
- P. SMACNA: Sheet Metal and Air Conditioning Contractors' National Association.

#### **1.4 SUBMITTALS**

- A. Quality-Assurance Submittals: Within 30 days from the Contractor's Notice to Proceed, submit 2 copies of evidence that the testing, adjusting, and balancing Agent and this Project's testing, adjusting, and balancing team members meet the qualifications specified in the "Quality Assurance" Article below.
- B. Certified Testing, Adjusting, and Balancing Reports: Submit 2 copies of reports prepared, as specified in this Section, on approved forms certified by the testing, adjusting, and balancing Agent.
- C. Warranty: Submit 2 copies of special warranty specified in the "Warranty" Article below.

#### **1.5 QUALITY ASSURANCE**

- A. Agent Qualifications for larger projects: Engage a testing, adjusting, and balancing agent certified by AABC.
- B. Agent Qualifications for smaller projects: Engage a testing, adjusting, and balancing agent certified by NEBB.
- C. Certification of Testing, Adjusting, and Balancing Reports: Certify the testing, adjusting, and balancing field data reports. This certification includes the following:

1. Review field data reports to validate accuracy of data and to prepare certified testing, adjusting, and balancing reports.
  2. Certify that the testing, adjusting, and balancing team complied with the approved testing, adjusting, and balancing plan and the procedures specified and referenced in this Specification.
- D. Testing, Adjusting, and Balancing Reports: Use standard forms from AABC's "National Standards for Testing, Adjusting, and Balancing."
- E. Testing, Adjusting, and Balancing Reports: Use standard forms from NEBB's "Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems."
- F. Instrumentation Type, Quantity, and Accuracy: As described in AABC national standards.
- G. Instrumentation Type, Quantity, and Accuracy: As described in NEBB's "Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems," Section II, "Required Instrumentation for NEBB Certification."
- H. Instrumentation Calibration: Calibrate instruments at least every 6 months or more frequently if required by the instrument manufacturer.

#### **1.6 PROJECT CONDITIONS**

- A. Partial Owner Occupancy: The Owner may occupy completed areas of the building before Substantial Completion. Cooperate with the Owner during testing, adjusting, and balancing operations to minimize conflicts with the Owner's operations.

#### **1.7 COORDINATION**

- A. Coordinate the efforts of factory-authorized service representatives for systems and equipment, HVAC controls installers, and other mechanics to operate HVAC systems and equipment to support and assist testing, adjusting, and balancing activities.
- B. Notice: Provide 7 days' advance notice for each test. Include scheduled test dates and times.
- C. Perform testing, adjusting, and balancing after leakage and pressure tests on air distribution systems have been satisfactorily completed.

#### **1.8 WARRANTY**

- A. General Warranty: The national project performance guarantee specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.

### **PART 2 - PRODUCTS (Not Applicable)**

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Examine Contract Documents to become familiar with project requirements and to discover conditions in systems' designs that may preclude proper testing, adjusting, and balancing of systems and equipment.
  - 1. Contract Documents are defined in the General and Supplementary Conditions of the Contract.
  - 2. Verify that balancing devices, such as test ports, gage cocks, thermometer wells, flow-control devices, balancing valves and fittings, and manual volume dampers, are required by the Contract Documents. Verify that quantities and locations of these balancing devices are accessible and appropriate for effective balancing and for efficient system and equipment operation.
- B. Examine approved submittal data of HVAC systems and equipment.
- C. Examine project record documents described in Division 1.
- D. Examine Architect's and Engineer's design data, including HVAC system descriptions, statements of design assumptions for environmental conditions and systems' output, and statements of philosophies and assumptions about HVAC system and equipment controls.
- E. Examine equipment performance data, including fan and pump curves. Relate performance data to project conditions and requirements, including system effects that can create undesired or unpredicted conditions that cause reduced capacities in all or part of a system. Calculate system effect factors to reduce the performance ratings of HVAC equipment when installed under conditions different from those presented when the equipment was performance tested at the factory. To calculate system effects for air systems, use tables and charts found in AMCA 201, "Fans and Systems," Sections 7 through 10; or in SMACNA's "HVAC Systems--Duct Design," Sections 5 and 6. Compare this data with the design data and installed conditions.
- F. Examine system and equipment installations to verify that they are complete and that testing, cleaning, adjusting, and commissioning specified in individual Specification Sections have been performed.
- G. Examine system and equipment test reports.
- H. Examine HVAC system and equipment installations to verify that indicated balancing devices, such as test ports, gage cocks, thermometer wells, flow-control devices, balancing valves and fittings, and manual volume dampers, are properly installed, and their locations are accessible and appropriate for effective balancing and for efficient system and equipment operation.
- I. Examine systems for functional deficiencies that cannot be corrected by adjusting and balancing.

- J. Examine air-handling equipment to ensure clean filters have been installed, bearings are greased, belts are aligned and tight, and equipment with functioning controls is ready for operation.
- K. Examine terminal units, such as variable-air-volume boxes and mixing boxes, to verify that they are accessible and their controls are connected and functioning.
- L. Examine strainers for clean screens and proper perforations.
- M. Examine 3-way valves for proper installation for their intended function of diverting or mixing fluid flows.
- N. Examine equipment for installation and for properly operating safety interlocks and controls.
- O. Examine automatic temperature system components to verify the following:
  - 1. Dampers, valves, and other controlled devices operate by the intended controller.
  - 2. Dampers and valves are in the position indicated by the controller.
  - 3. Integrity of valves and dampers for free and full operation and for tightness of fully closed and fully open positions. This includes dampers in multizone units, mixing boxes, and variable-air-volume terminals.
  - 4. Automatic modulating and shutoff valves, including 2-way valves and 3-way mixing and diverting valves, are properly connected.
  - 5. Thermostats and humidistats are located to avoid adverse effects of sunlight, drafts, and cold walls.
  - 6. Sensors are located to sense only the intended conditions.
  - 7. Sequence of operation for control modes is according to the Contract Documents.
  - 8. Controller set points are set at design values. Observe and record system reactions to changes in conditions. Record default set points if different from design values.
  - 9. Interlocked systems are operating.
  - 10. Changeover from heating to cooling mode occurs according to design values.
- P. Report deficiencies discovered before and during performance of testing, adjusting, and balancing procedures.

### **3.2 PREPARATION**

- A. Complete system readiness checks and prepare system readiness reports. Verify the following:
  - 1. Permanent electrical power wiring is complete.
  - 2. Hydronic systems are filled, clean, and free of air.
  - 3. Automatic temperature-control systems are operational.
  - 4. Equipment and duct access doors are securely closed.
  - 5. Balance, fire dampers are open.
  - 6. Isolating and balancing valves are open and control valves are operational.
  - 7. Ceilings are installed in critical areas where air-pattern adjustments are required and access to balancing devices is provided.

8. Windows and doors can be closed so design conditions for system operations can be met.

### **3.3 GENERAL TESTING AND BALANCING PROCEDURES**

- A. Perform testing and balancing procedures on each system according to the procedures contained in AABC national standards and this Section.
- B. Perform testing and balancing procedures on each system according to the procedures contained in NEBB's "Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems" and this Section.
- C. Cut insulation, ducts, pipes, and equipment cabinets for installation of test probes to the minimum extent necessary to allow adequate performance of procedures. After testing and balancing, close probe holes and patch insulation with new materials identical to those removed. Restore vapor barrier and finish according to the insulation Specifications for this Project.
- D. Mark equipment settings with paint or other suitable, permanent identification material, including damper-control positions, valve indicators, fan-speed-control levers, and similar controls and devices, to show final settings.

### **3.4 FUNDAMENTAL AIR SYSTEMS' BALANCING PROCEDURES**

- A. Prepare test reports for both fans and outlets. Obtain manufacturer's outlet factors and recommended testing procedures. Crosscheck the summation of required outlet volumes with required fan volumes.
- B. Prepare schematic diagrams of systems' "as-built" duct layouts.
- C. For variable-air-volume systems, develop a plan to simulate diversity.
- D. Check the airflow patterns from the outside-air louvers and dampers and the return- and exhaust-air dampers, through the supply-fan discharge and mixing dampers.
- E. Locate start-stop and disconnect switches, electrical interlocks, and motor starters.
- F. Verify that motor starters are equipped with properly sized thermal protection.
- G. Check dampers for proper position to achieve desired airflow path.
- H. Check for airflow blockages.
- I. Check condensate drains for proper connections and functioning.
- J. Check for proper sealing of air-handling unit components.

### **3.5 CONSTANT-VOLUME AIR SYSTEMS' BALANCING PROCEDURES**

- A. The procedures in this Article apply to constant-volume supply-, return-, and exhaust-air systems.

- B. Adjust fans to deliver total design airflows within the maximum allowable rpm listed by the fan manufacturer.
1. Measure fan static pressures to determine actual static pressure as follows:
    - a. Measure outlet static pressure as far downstream from the fan as practicable and upstream from restrictions in ducts such as elbows and transitions.
    - b. Measure static pressure directly at the fan outlet or through the flexible connection.
    - c. Measure inlet static pressure of single-inlet fans in the inlet duct as near the fan as possible, upstream from flexible connection and downstream from duct restrictions.
  2. Measure static pressure across each air-handling unit component.
    - a. Simulate dirty filter operation and record the point at which maintenance personnel must change filters.
  3. Compare design data with installed conditions to determine variations in design static pressures versus actual static pressures. Compare actual system effect factors with calculated system effect factors to identify where variations occur. Recommend corrective action to align design and actual conditions.
  4. Adjust fan speed higher or lower than design with the approval of the Architect. Make required adjustments to pulley sizes, motor sizes, and electrical connections to accommodate fan-speed changes.
  5. Do not make fan-speed adjustments that result in motor overload. Consult equipment manufacturers about fan-speed safety factors. Modulate dampers and measure fan-motor amperage to ensure no overload will occur. Measure amperage in full cooling, full heating, and economizer modes to determine the maximum required brake horsepower.
- C. Adjust volume dampers for main duct, submain ducts, and major branch ducts to design airflows within specified tolerances.
1. Measure static pressure at a point downstream from the balancing damper and adjust volume dampers until the proper static pressure is achieved.
    - a. Where sufficient space in submains and branch ducts is unavailable for Pitot-tube traverse measurements, measure airflow at terminal outlets and inlets and calculate the total airflow for that zone.
  2. Remeasure each submain and branch duct after all have been adjusted. Continue to adjust submains and branch ducts to design airflows within specified tolerances.
- D. Measure terminal outlets and inlets without making adjustments.
1. Measure terminal outlets using a direct-reading hood or the outlet manufacturer's written instructions and calculating factors.
- E. Adjust terminal outlets and inlets for each space to design airflows within specified tolerances of design values. Make adjustments using volume dampers rather than extractors and the dampers at the air terminals.

1. Adjust each outlet in the same room or space to within specified tolerances of design quantities without generating noise levels above the limitations prescribed by the Contract Documents.
2. Adjust patterns of adjustable outlets for proper distribution without drafts.

### **3.6 VARIABLE-AIR-VOLUME SYSTEMS' ADDITIONAL PROCEDURES**

- A. Compensating for Diversity: When the total airflow of all terminal units is more than the fan design airflow volume, place a selected number of terminal units at a maximum set-point airflow condition until the total airflow of the terminal units equals the design airflow of the fan. Select the reduced airflow terminal units so they are distributed evenly among the branch ducts.
- B. Pressure-Dependent, Variable-Air-Volume Systems without Diversity: After the fan systems have been adjusted, adjust the variable-air-volume systems as follows:
  1. Balance systems similar to constant-volume air systems.
  2. Set terminal units and supply fan at full-airflow condition.
  3. Adjust inlet dampers of each terminal unit to design airflow and verify operation of the static-pressure controller. When total airflow is correct, balance the air outlets downstream from terminal units as described for constant-volume air systems.
  4. Readjust fan airflow for final maximum readings.
  5. Measure operating static pressure at the sensor that controls the supply fan, if one is installed, and verify operation of the static-pressure controller.
  6. Set supply fan at minimum airflow if minimum airflow is indicated. Measure static pressure to verify that it is being maintained by the controller.
  7. Set terminal units at minimum airflow and adjust controller or regulator to deliver the designed minimum airflow. Check air outlets for a proportional reduction in airflow as described for constant-volume air systems.
    - a. If air outlets are out of balance at minimum airflow, report the condition but leave the outlets balanced for maximum airflow.
  8. Measure the return airflow to the fan while operating at maximum return airflow and minimum outside airflow. Adjust the fan and balance the return-air ducts and inlets as described for constant-volume air systems.

### **3.7 FUNDAMENTAL PROCEDURES FOR HYDRONIC SYSTEMS**

- A. Prepare test reports with pertinent design data and number in sequence starting at pump to end of system. Check the sum of branch-circuit flows against approved pump flow rate. Correct variations that exceed plus or minus 5 percent.
- B. Prepare schematic diagrams of systems' "as-built" piping layouts.

### **3.8 MOTORS**

- A. Motors, 1/2 HP and Larger: Test at final balanced conditions and record the following data:



1. Manufacturer, model, and serial numbers.
  2. Motor horsepower rating.
  3. Motor rpm.
  4. Efficiency rating if high-efficiency motor.
  5. Nameplate and measured voltage, each phase.
  6. Nameplate and measured amperage, each phase.
  7. Starter thermal-protection-element rating.
- B. Motors Driven by Variable-Frequency Controllers: Test for proper operation at speeds varying from minimum to maximum. Test the manual bypass for the controller to prove proper operation. Record observations, including controller manufacturer, model and serial numbers, and nameplate data.

### **3.9 CONDENSING UNITS**

- A. Verify proper rotation of fans and measure entering- and leaving-air temperatures. Record compressor data.

### **3.10 HEAT-TRANSFER COILS**

- A. Electric-Heating Coils: Measure the following data for each coil:
1. Nameplate data.
  2. Airflow.
  3. Entering- and leaving-air temperatures at full load.
  4. Voltage and amperage input of each phase at full load and at each incremental stage.
  5. Calculated kW at full load.
  6. Fuse or circuit-breaker rating for overload protection.

### **3.11 TEMPERATURE TESTING**

- A. During testing, adjusting, and balancing, report need for adjustment in temperature regulation within the automatic temperature-control system.
- B. Measure outside-air, wet- and dry-bulb temperatures.

### **3.12 TEMPERATURE-CONTROL VERIFICATION**

- A. Verify that controllers are calibrated and commissioned.
- B. Check transmitter and controller locations and note conditions that would adversely affect control functions.
- C. Record controller settings and note variances between set points and actual measurements.
- D. Verify operation of limiting controllers (i.e., high- and low-temperature controllers).

- E. Verify free travel and proper operation of control devices such as damper and valve operators.
- F. Verify sequence of operation of control devices. Note air pressures and device positions and correlate with airflow measurements. Note the speed of response to input changes.
- G. Confirm interaction of electrically operated switch transducers.
- H. Confirm interaction of interlock and lockout systems.
- I. Verify main control supply-air pressure and observe compressor and dryer operations.
- J. Record voltages of power supply and controller output. Determine if the system operates on a grounded or nongrounded power supply.
- K. Note operation of electric actuators using spring return for proper fail-safe operations.

### **3.13 TOLERANCES**

- A. Set HVAC system airflow flow rates within the following tolerances:
  - 1. Supply and Exhaust Fans: Plus 5 to plus 10 percent.
  - 2. Air Outlets and Inlets: 0 to minus 10 percent.

### **3.14 FINAL REPORT**

- A. General: Typewritten, or computer printout in letter-quality font, on standard bond paper, in 3-ring binder, tabulated and divided into sections by tested and balanced systems.
- B. Include a certification sheet in front of binder signed and sealed by the certified testing and balancing engineer.
  - 1. Include a list of the instruments used for procedures, along with proof of calibration.
- C. Final Report Contents: In addition to the certified field report data, include the following:
  - 1. Fan curves.
  - 2. Manufacturers' test data.
  - 3. Field test reports prepared by system and equipment installers.
  - 4. Other information relative to equipment performance, but do not include approved Shop Drawings and Product Data.
- D. General Report Data: In addition to the form titles and entries, include the following data in the final report, as applicable:
  - 1. Title page.
  - 2. Name and address of testing, adjusting, and balancing Agent.

3. Project name.
  4. Project location.
  5. Architect's name and address.
  6. Engineer's name and address.
  7. Contractor's name and address.
  8. Report date.
  9. Signature of testing, adjusting, and balancing Agent who certifies the report.
  10. Summary of contents, including the following:
    - a. Design versus final performance.
    - b. Notable characteristics of systems.
    - c. Description of system operation sequence if it varies from the Contract Documents.
  11. Nomenclature sheets for each item of equipment.
  12. Data for terminal units, including manufacturer, type size, and fittings.
  13. Notes to explain why certain final data in the body of reports vary from design values.
  14. Test conditions for fans performance forms, including the following:
    - a. Settings for outside-, return-, and exhaust-air dampers.
    - b. Conditions of filters.
    - c. Cooling coil, wet- and dry-bulb conditions.
    - d. Face and bypass damper settings at coils.
    - e. Fan drive settings, including settings and percentage of maximum pitch diameter.
    - f. Settings for supply-air, static-pressure controller.
    - g. Other system operating conditions that affect performance.
- E. System Diagrams: Include schematic layouts of air and hydronic distribution systems. Present with single-line diagrams and include the following:
1. Quantities of outside, supply, return, and exhaust airflows.
  2. Duct, outlet, and inlet sizes.
  3. Balancing stations.
- F. Air-Handling Unit Test Reports: air-handling units with coils, include the following:
1. Unit Data: Include the following:
    - a. Unit identification.
    - b. Location.
    - c. Make and type.
    - d. Model number and unit size.
    - e. Manufacturer's serial number.
    - f. Unit arrangement and class.
    - g. Discharge arrangement.
    - h. Sheave make, size in inches (mm), and bore.
    - i. Number of belts, make, and size.
    - j. Number of filters, type, and size.
  2. Motor Data: Include the following:

- a. Make and frame type and size.
  - b. Horsepower and rpm.
  - c. Volts, phase, and hertz.
  - d. Full-load amperage and service factor.
3. Test Data: Include design and actual values for the following:
- a. Total airflow rate in cfm (L/s).
  - b. Total system static pressure in inches wg (Pa).
  - c. Fan rpm.
  - d. Discharge static pressure in inches wg (Pa).
  - e. Preheat coil static-pressure differential in inches wg (Pa).
  - f. Cooling coil static-pressure differential in inches wg (Pa).
  - g. Heating coil static-pressure differential in inches wg (Pa).
  - h. Outside airflow in cfm (L/s).
  - i. Return airflow in cfm (L/s).
  - j. Outside-air damper position.
  - k. Return-air damper position.
- G. Electric-Coil Test Reports: For electric duct coils, and electric coils installed in central-station air-handling units, include the following:
- 1. Unit Data: Include the following:
    - a. System identification.
    - b. Location.
    - c. Coil identification.
    - d. Capacity in Btuh (kW).
    - e. Number of stages.
    - f. Connected volts, phase, and hertz.
    - g. Rated amperage.
  - 2. Test Data: Include design and actual values for the following:
    - a. Heat output in Btuh (kW).
    - b. Airflow rate in cfm (L/s).
    - c. Air velocity in fpm (m/s).
    - d. Entering-air temperature in deg F (deg C).
    - e. Leaving-air temperature in deg F (deg C).
    - f. Voltage at each connection.
    - g. Amperage for each phase.
- H. Fan Test Reports: For exhaust fans, include the following:
- 1. Fan Data: Include the following:
    - a. System identification.
    - b. Location.
    - c. Make and type.
    - d. Model number and size.
    - e. Manufacturer's serial number.
    - f. Arrangement and class.

2. Motor Data: Include the following:
  - a. Make and frame type and size.
  - b. Horsepower and rpm.
  - c. Volts, phase, and hertz.
  - d. Full-load amperage and service factor.
  - e. Number of belts, make, and size.
3. Test Data: Include design and actual values for the following:
  - a. Total airflow rate in cfm (L/s).
  - b. Total system static pressure in inches wg (Pa).
  - c. Fan rpm.
  - d. Discharge static pressure in inches wg (Pa).
  - e. Suction static pressure in inches wg (Pa).
4. Condenser Test Data: Include design and actual values for the following:
  - a. Refrigerant pressure in psig (kPa).
  - b. Refrigerant temperature in deg F (deg C).
5. Evaporator Test Reports: Include design and actual values for the following:
  - a. Refrigerant pressure in psig (kPa).
  - b. Refrigerant temperature in deg F (deg C).
6. Compressor Test Data: Include design and actual values for the following:
  - a. Make and model number.
  - b. Manufacturer's serial number.
  - c. Suction pressure in psig (kPa).
  - d. Suction temperature in deg F (deg C).
  - e. Discharge pressure in psig (kPa).
  - f. Discharge temperature in deg F (deg C).
  - g. Oil pressure in psig (kPa).
  - h. Oil temperature in deg F (deg C).
  - i. Voltage at each connection.
  - j. Amperage for each phase.
  - k. The kW input.
  - l. Crankcase heater kW.
  - m. Refrigerant low-pressure-cutoff set point in psig (kPa).
  - n. Refrigerant high-pressure-cutoff set point in psig (kPa).
7. Refrigerant Test Data: Include design and actual values for the following:
  - a. Oil level.
  - b. Refrigerant level.
  - c. Relief valve setting in psig (kPa).
  - d. Unloader set points in psig (kPa).
  - e. Percentage of cylinders unloaded.
  - f. Bearing temperatures in deg F (deg C).
  - g. Vane position.
  - h. Low-temperature-cutoff set point in deg F (deg C).

- I. Condenser Reports: For refrigerant side of unitary systems, stand-alone refrigerant compressors, air-cooled condensing units, include the following:
  1. Unit Data: Include the following:
    - a. Unit identification.
    - b. Location.
    - c. Unit make and model number.
    - d. Manufacturer's compressor serial numbers.
    - e. Compressor make.
    - f. Compressor model and serial numbers.
    - g. Refrigerant weight in lb (kg).
  2. Test Data: Include design and actual values for the following:
    - a. Entering-air, dry-bulb temperature in deg F (deg C).
    - b. Leaving-air, dry-bulb temperature in deg F (deg C).
    - c. Control settings.
    - d. Unloader set points.
    - e. Low-pressure-cutout set point in psig (kPa).
    - f. High-pressure-cutout set point in psig (kPa).
    - g. Suction pressure in psig (kPa).
    - h. Suction temperature in deg F (deg C).
    - i. Condenser refrigerant pressure in psig (kPa).
    - j. Condenser refrigerant temperature in deg F (deg C).
    - k. Oil pressure in psig (kPa).
    - l. Oil temperature in deg F (deg C).
    - m. Voltage at each connection.
    - n. Amperage for each phase.
    - o. The kW input.
    - p. Number of fans.

### **3.15 ADDITIONAL TESTS**

- A. Within 90 days of completing testing, adjusting, and balancing, perform additional testing and balancing to verify that balanced conditions are being maintained throughout and to correct unusual conditions.

**END OF SECTION**

**DIVISION 16010**  
**SUMMARY OF ELECTRICAL WORK**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, Division 1 Specification Sections and other Division 15 Specification Sections, apply to this Section.

**1.2 WORK COVERED BY CONTRACT DOCUMENTS**

- A. The following Summary of Work is intended as an aid to achieve an understanding of the various elements of work included in the project, as is not intended to be all-inclusive. Detailed descriptions of work and requirements are given in drawings and specifications.
- B. General Scope of Work:
  - 1. Providing new panels, feeders, conduits, electrical meter, disconnect, combination starter/ disconnect, fire alarm, rough-in for telephone and data system, intercom system, and new light fixtures.

**1.4 COORDINATION**

- A. All electrical work shall be done under sub-contract to a General Contractor. Electrical Contractor shall coordinate all work through General Contractor, even in areas where only electrical work is to take place.
- B. Work shall take place with minimal disruption to Owner's operations in areas surrounding the new building.
- C. Cooperate fully with other contractors so that work under those contracts may be carried out smoothly, without interfering with or delaying work under this Contract.
- D. Fully coordinate with mechanical contractor for providing power to mechanical equipment.

**1.5 UTILITIES**

- 1. Coordinate with power company and provide conduit, and trenching from transformer to power source. Coordinate with water, telephone, cable and gas utilities to locate all utilities prior to digging in any area.
- 2. Obtain any approvals required from utilities to relocate utilities.
- 3. Cost of relocating or bypassing utilities indicated on drawings shall be included in Base Bid.

**1.6 CONTRACTOR USE OF PREMISES**

- A. Use of the Site: Limit use of the premises to work in areas indicated. Confine operations to areas within contract limits indicated. Do not disturb portions of the site beyond the areas in which the Work is indicated.
  - 1. Owner Occupancy: Allow for Owner occupancy and use by the public.

2. Driveways and Entrances: Keep driveways and entrances serving the premises, clear and available to the Owner, the Owner's employees, and emergency vehicles at all time. Do not use these areas for parking or storage of materials. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.
- B. Site Safety: Take every precaution to ensure the site does not present a threat to the safety of occupants and/or workers. Minimal safety requirements include, but are not limited to the following:
1. Temporary fencing around construction areas.
  2. Yellow caution tape and construction barricades along open trenches during the day. Trenches shall be covered at night and warning lights provided on construction barricades.
  3. Temporary fencing around equipment while site work is in progress.

## 1.7

### **SUBMITTALS**

1. To expedite the submittal process more efficiently, do not piece-meal the submittals. Submit entire electrical in a bound enclosure. This will eliminate delays in the submittal process. Unbound submittals shall be returned without review. Submit 10 copies minimum.

**END OF SECTION**



**DIVISION 16020**  
**BASIC ELECTRICAL REQUIREMENTS**

**PART 1 – GENERAL**

**1.1 RELATED REQUIREMENTS**

- A. The General Provisions, Supplemental General Provisions, Special Provisions, Division 1 Specification Sections and all relevant documents shall form a part of this Division of the Specifications, and shall be incorporated in this Section and each Division 16 Section hereinafter as if repeated verbatim herein. All conditions imposed by these documents shall be applicable to all portions of the work under this Division. Certain specific paragraphs of said references may be referred to hereinafter in this Division. These references are intended to point out specific items to the Contractor, but in no way relieve him of the responsibility of reading and complying with all relevant parts of the entire Specification.
- B. The Contractor shall examine and coordinate with all Contract Drawings and Specifications, and all Addenda issued. Failure to comply shall not relieve him of responsibility. The omission of details of other portions of the work from this Division shall not be used as a basis for a request for additional compensation.
- C. The specific features and details for other portions of the work related to the construction in progress or to the adjacent building shall be determined by examination at the site.

**1.2 SCOPE OF WORK**

- A. The requirements contained in this Section apply to all work performed under Division 16 of these Specifications.
- B. The work covered by this Division of the Specifications comprises the furnishing of labor, material, equipment, transportation, tools and services, and performing operations required for, and reasonably incidental to, the installation of the work in accordance with the applicable Contract Documents, and subject to the terms and conditions of the Contract.
- C. Refer to other Divisions of the Specifications for related work.

**1.3 DEFINITION OF "CONTRACTOR"**

- A. Where the word "Contractor" is used under any Section of this Division of the Specifications, it shall mean the Contractor engaged to execute the work included under that Section, even though this Contractor may be technically described as a Subcontractor, or an authorized representative.
- B. If the Contractor, engaged to execute a portion of the work, employs a Subcontractor to perform some of that work, he shall be completely responsible for the proper execution of this Subcontractor's work, in full conformity with the

#### **1.4 RESPONSIBILITY OF THE CONTRACTOR**

- A. The Contractor shall be responsible for all work of every description in connection with this Division of the Specifications. The Contractor shall specifically and distinctly assume, and does so assume, all risk for damage or injury from whatever cause to property or person used or employed on or in connection with this work and of all damages or injury to any person or property wherever located, resulting from an action or operation under the Contract in connection with the work, and undertake the responsibility to defend the Owner against all claims on account of any such damage or injury.
- B. The Contractor will be held responsible for the satisfactory execution and completion of the work in accordance with the true intent of the Contract Documents. The Contractor shall provide without extra charge all incidental items required as part of the work, even though it may not be specifically indicated. If the Contractor has reason for objecting to the use of any material, equipment, device or method of construction as indicated, the Contractor shall make report of such objections to the Owner's Representative, obtain proper approval and adjustment to the Contract, and shall proceed with the work.

#### **1.5 TERMINOLOGY**

- A. Whenever the words "furnish", "provide", "furnish and install", "provide and install", and similar phrases occur, it is the intent that the materials, equipment and devices described be furnished, installed and connected under this Division, complete for operation, unless specifically noted to the contrary.
- B. It is also the intent, unless specifically noted to the contrary, that all materials, equipment and devices described and specified under this Division of the Specifications be similarly furnished, installed and connected under this Division, whether or not a phrase as described in the preceding paragraph has been actually included.
- C. Whenever the words "Owner's Representative" occurs, it is intended to refer to the Architect, Engineer and/or specific Owner's Representative responsible for or capable of providing the necessary direction pertaining to the referenced issue.

#### **1.6 ORDINANCES, PERMITS AND CODES**

- A. It shall be the Contractor's duty to perform the work and provide the materials covered by these specifications in conformance with all ordinances and regulations of all authorities having jurisdiction.
- B. All work herein shall conform to all applicable laws, ordinances and regulations of the local utility companies.
- C. The Contractor shall obtain and pay for all permit and connection fees as required for the complete installation of the specified systems, equipment,

devices and materials.

- D. The Contractor shall obtain permits, plan checks, inspections and approvals applicable to the work as required by the regulatory authorities. Fees and costs of any nature whatsoever incidental to these permits, inspections and approvals shall be assumed and paid by the Contractor. The pro-rata costs, if any, for utilities serving this property will be paid for by the Owner and shall not be included as part of this Contract.
- E. The work shall be in accordance with, but shall not be limited to, the requirements of:
  - 1 National Fire Protection Association
  - 2 National Electrical Code
  - 3 National Safety Code
  - 4 State of Texas Safety Code
  - 5. Local City Building Codes
  - 6. State of Texas Building Codes
- F. Codes and standards referred to are minimum standards. Where the requirements of the Drawings or Specifications exceed those of the codes and regulations, the Drawings and Specifications govern.

## **1.7 MATERIALS, EQUIPMENT AND DEVICE DESCRIPTION**

- A. Materials, equipment and devices shall be of the best quality customarily applied in quality commercial practice, and shall be the products of reputable manufacturers. Each major component shall bear a nameplate giving the name and address of the manufacturer, and the catalog number or designation of the component.
- B. Materials, equipment and devices furnished under this Division of the Specifications shall be essentially the standard product of the specified manufacturer, or where allowed, an alternate manufacturer. Where two or more units of the same kind or class of a specific item are required, these shall be the products of a single manufacturer; however, the component parts of the item need not be the products of one manufacturer.
- C. In describing the various materials, equipment and devices, in general each item will be described singularly, even though there may be a multiplicity of identical items. Also, where the description is only general in nature, exact sizes, duties, space arrangements, horsepower requirements and other data shall be determined by reference to the Contract Documents.
- D. Space allocations for materials, equipment and devices have been made on the

basis of present and known future requirements and the dimensions of items of equipment or devices of a particular manufacturer whether indicated or not. The Contractor shall verify that all materials, equipment and devices proposed for use on this project are within the constraints of the allocated space.

## **1.8 QUALITY ASSURANCE**

- A. Materials, equipment and devices shall be new and of the quality specified, and shall be free from defects at the time of installation. Materials, equipment and devices damaged in shipment or otherwise damaged or found defective prior to acceptance by the Owner shall not be repaired at the job site, but shall be replaced with new materials, equipment or devices identical with those damaged, unless specifically approved otherwise by the Owner's Representative.
- B. Wherever a UL standard has been established for a particular type of material, equipment or device, each item of such material, equipment or device provided on this project shall meet the requirements of the UL standard in every way, and shall be UL listed and labeled.

## **1.9 REFERENCE STANDARDS**

- A. Materials, equipment, devices and workmanship shall comply with applicable local, county, state and national codes, laws and ordinances, utility company regulations and industry standards.
- B. In case of differences between building codes, state laws, local ordinances, industry standards, utility company regulations and the Contract Documents, the most stringent shall govern. The Contractor shall promptly notify the Owner's Representative in writing of any such difference. Should the Contractor perform any work that does not comply with local codes, laws and ordinances, industry standards or other governing regulations, the work shall be corrected of noncompliance deficiencies with the Contractor bearing all costs.
- C. In addition to the aforementioned ordinances, industry standards published by the following organizations shall apply:

AABM	-	American Association of Battery Manufacturers
ADA	-	American's with Disabilities Act
AIA	-	American Institute of Architects
ANSI	-	American National Standards Institute
ASTM	-	American Society for Testing and Materials

- CBM - Certified Ballast Manufacturers Association
- ETL - Electrical Testing Laboratories
- FM - Factory Mutual
- ICEA - Insulated Cable Engineers Associated
- IEEE - Institute of Electrical and Electronic Engineers
- IES - Illuminating Engineering Society
- IRI - Industrial Risk Insurance
- NBS - National Bureau of Standards
- NEC - National Electrical Code
- NECA - National Electrical Contractors Association
- NEMA - National Electrical Manufacturers Association
- NESC - National Electrical Safety Code
- NETA - National Electrical Testing Association
- NFPA - National Fire Protection Association
- UL - Underwriters Laboratories

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## **1.10 DRAWINGS AND SPECIFICATIONS**

- A. The interrelation of the Drawings (including the schedules) and the Specifications are as follows:
  - 1 The Drawings establish quantities, locations, dimensions and details of materials, equipment and devices. The schedules on the Drawings indicate the capacities, characteristics and components.
  - 2 The Specifications provide written requirements for the quality, standard and nature of the materials, equipment, devices and construction systems.
- B. The Drawings and Specifications shall be considered as being compatible; therefore, the work called for by one and not by the other shall be furnished and installed as though called for by both. Resolution of conflicts between Drawings and Specifications shall be as follows:

- 1 If the Drawings and Specifications disagree in themselves, or with each other, the Contractor's pricing shall be based on furnishing and installing the most expensive combination of quality and quantity of work indicated for a complete operable system. Contractor is responsible to notifying the Architect and Engineer. In the event of this type of disagreement, the resolution shall be determined by the Owner's Representative. The contractor shall assume for an operable system at the most expensive combination as per the latest National Electrical Code. The contractor shall review all drawings and specifications prior to bid date.
  - 2 The Contractor shall be responsible for bringing any conflicts in the Drawings and the Specifications to the attention of the Owner's Representative immediately, prior to bid date.
  - 3 In general, if there is conflict between the Drawings and Specifications, the Drawings shall govern the Specifications.
  - 4 Where the Specifications do not fully agree with schedules on the Drawings, the schedules shall govern. Actual numerical dimensions indicated on the Drawings govern scale measurements and large scale details govern small scale drawings.
  - 5 Materials, equipment and devices called for on the Drawings and not indicated herein, shall be completely provided and installed as though it were fully described herein.
  - 6 Materials, equipment and devices called for herein shall be completely provided and installed, whether or not it is fully detailed, scheduled or indicated on the Drawings.
- C. The Contractor shall examine the Drawings and Specifications of the other portions of the work for fixtures and finishes in connection with this work. The Contractor shall carefully examine the Drawings to determine the general construction conditions, and shall familiarize himself with all limitations caused by such conditions.
- D. When discrepancies exist between scale and dimension, or between the Drawings of the various portions of the work, they shall be called to the attention of the Owner's Representative for further instruction, whose instructions shall be final and binding and work promptly resumed without any additional cost to the Owner.
- E. Review the construction details of the building(s) as illustrated on the Drawings of the other portions of the work, i.e., architectural, structural, civil, landscape, etc., and be guided thereby. Route conduits and set all boxes as required by the pace of the general construction.
- F. The Drawings diagrammatically show the sizes and locations of the various equipment and devices, and the sizes of the major interconnecting wires, without showing exact details as to elevations, offsets, control wiring and other

installation requirements. Carefully layout the work at the site to conform to the architectural and structural conditions, to avoid obstructions and to permit proper grading of pipe associated with other portions of the work. In cooperation with other Contractors, determine the exact location of equipment and devices and connections thereto by reference to the submittals and rough-in drawings, and by measurements at the site. Make minor relocations necessitated by the conditions at the site, or directed by the Owner's Representative, without additional cost to the Owner.

- G. The Drawings and Specifications are intended to describe and illustrate systems which will not interfere with the structure of the building(s), fit into the available spaces, and insure complete and satisfactory operating installations. Prepare installation drawings as required for all critical areas illustrating the installation of the work in this Division as related to the work of all other Divisions and correct all interferences with the other portions of the work or with the building structures before the work proceeds.
- H. The Drawings do not indicate the existing electrical installations other than to identify modifications or extensions thereto. Visit the site and ascertain the conditions to be met and the work to be accomplished in removing and modifying the existing work, and in installing the new work. Failure to comply with this shall not constitute grounds for any additional payment in connection with removing or modifying any part of the existing installation or installing any new or temporary work under this Division.

#### **1.11 SUBMITTALS**

- A. Submit product data and shop drawings in accordance with Division 1 of the Specifications.
- B. Process product data and shop drawings to insure that the proposed materials, equipment and devices conform to the requirements of the Contract Documents, and that there are no omissions or duplications. Provide layouts, fabrication information and data for systems, materials, equipment and devices proposed for the project.
- C. Submittals shall be provided for review and approval on all systems, equipment, devices and materials proposed for use on this project. Submittals shall include, but not be limited to, the following:
  - 1 Lighting and Appliance Panelboards
  - 2 Disconnect Switches
  - 3 Circuit Breakers and Fuses
  - 4 Materials: conduit, conductors, connectors, supports, etc.
  - 5 Lighting Fixtures, Lamps and Control Systems/Devices

- 6 Wiring Devices
  - 7 Transformers
  - 8 Distribution Panelboards
  - 9 Motor Control Center
  - 10 As indicated on each submittal section
- D. The product data shall not consist of manufacturer's catalogs or cut sheets that contain no indication of the exact item offered. The submission on individual items shall designate the exact item offered.
  - E. Do not submit detailed quantitative listings of materials, equipment and devices. It is the Contractor's responsibility to provide proper sizes and quantities to conform to Contract Documents.
  - F. Assemble submittals on related items procured from a single manufacturer in bound brochures or other suitable package form, rather than submitting a multiplicity of loose sheets.
  - G. Prepare shop drawings whenever equipment proposed varies in physical size and arrangement from that indicated thus causing rearrangement of equipment space, where tight spaces require extreme coordination between this work and other work, where called for elsewhere in these Specifications and where specifically requested by the Owner's Representative. Shop drawings shall be prepared at a scale of not less than 1/4 inch equals 1 foot.
  - H. The Contractor shall sign the submittal as an indication of compliance with the Contract Documents. If there are any deviations from the Contract Documents, he shall so indicate on the submittal. Any deviations not so indicated shall be cause for rejection and removal of the non-complying equipment at the Contractor's expense.

#### **1.12 SUBSTITUTIONS**

- A. Where a single manufacturer is mentioned by trade name or manufacturer's name, unless specifically noted otherwise, it is the only manufacturer that will be accepted.
- B. Where multiple manufacturers are listed, none other than those manufacturers will be accepted.
- C. Manufacturers not listed will be considered for substitution prior to bid only. The substitute manufacturer shall submit a complete copy of the appropriate technical specification section minimum seven (7) business days prior to bid with each sub-paragraph noted with the comment, "compliance", "deviation", "alternate" or



“not applicable”. In the case of non-primary, vendor-supplied items, the name of the sub-vendor supplying said item, including model number, shall be indicated.

- 1 By noting the term "compliance" or "C", it shall be understood that the manufacturer is in full compliance with the item specified and will provide exactly the same with no deviations.
  - 2 By noting the term "deviation" or "D", it shall be understood that the manufacturer prefers to provide a different component in lieu of that specified. Manufacturer shall indicate all deviations.
  - 3 By noting the term "alternate" or "A", it shall be understood that the manufacturer proposes to provide the same operating function but prefers to do it in a different manner. An alternate shall be fully described as to what the manufacturer proposes to provide.
  - 4 By noting the term “not applicable” or “N/A”, it shall be understood that the specified item is not applicable to the project.
- D. It shall be understood that space allocations have been made on the basis of present and known future requirements and the dimensions of items of equipment or devices of a particular manufacturer whether indicated or not. If any item of equipment or device is offered in substitution which differs substantially in dimension or configuration from that indicated on the Drawings or specifications, provide as part of the submittal 1/4 inch equals 1 foot scaled drawings showing that the substitute can be installed in the space available without interfering with other portions of the work or with access for operations and maintenance in the completed project.
- E. Where substitute equipment or devices requiring different arrangement or connections from that indicated is accepted by the Owner's Representative, install the equipment or devices to operate properly and in harmony with the intent of the Contract Documents, making all incidental changes in piping, ductwork or wiring resulting from the equipment or device selection without any additional cost to the Owner. The Contractor shall pay all additional costs incurred by other portions of the work in connection with the substituted equipment or device.
- F. The Owner's Representative reserves the right to call for samples of any item of material, equipment or device offered in substitution, together with a sample of the specific item when, in their opinion, the quality of the item and/or the appearance is involved, and it is deemed that an evaluation of the item may be better made by visual inspection.
- G. When any request for a substitution of material, equipment or device is submitted and rejected, the item named in the Contract Documents shall be furnished. Repetitive submittal of substitutions for the same item will not be considered.

### **1.13 INSTALLATION DRAWINGS**

- A. Prepare installation drawings for coordinating the work of this Division with the work of other Divisions, to illustrate its concealment in finished spaces, to avoid obstructions, and to demonstrate the adaptability of any item of material, equipment or device in the space upon which the Contract Documents are based.
- B. Use these drawings in the field for the actual installation of this work. Provide three (3) copies, not for approval, to the Owner's Representative for his information, review and record.

### **1.14 WORKMANSHIP AND INSTALLATION**

- A. In no case shall the Contractor provide a class of material, equipment, device or workmanship less than that required by the Contract Documents or applicable codes, regulations, ordinances or standards. All modifications which may be required by a local authority having legal jurisdiction over all or any part of the work shall be made by the Contractor without any additional charge. In all cases where such authority requires deviations from the requirements of the Drawings or Specifications, the Contractor shall report same to the Owner's Representative and shall secure his approval before the work is started.
- B. The work shall be performed by properly licensed technicians skilled in their respective trades. All materials, equipment and devices shall be installed in accordance with the recommendations of the manufacturer and in the best standard practice to bring about results of a first class condition.
- C. The NECA "Standards of Installation" as published by the National Electrical Contractors Association shall be considered a part of these Specifications, except as specifically modified by other provisions contained in these Specifications.

### **1.15 INSPECTION OF SITE**

- A. The accompanying drawings do not indicate existing installations other than to identify modifications of and extensions thereto. The Contractor shall visit the site, inspect the installations and ascertain the conditions to be met and the work to be performed. Failure to comply with this shall not constitute ground for any additional payments in connection with removing or modifying any part of the existing installations and/or installing any new work under this Division.
- B. Review construction details of the adjacent building presently under construction during the site inspection and include all work required to modify the existing installations and install new materials, comprising a part of the installation. Review all construction details of the new building as illustrated on the drawings and be guided thereby.

### **1.16 WARRANTY**

- A. All materials, equipment, devices and workmanship shall be warranted for a period of one year from the date of acceptance by the Owner's Representative for beneficial use by the Owner, except that where specific equipment is noted to have extended warranties. The warranty shall be in accordance with AIA Document A201. The Contractor shall be responsible for the proper registration of these warranties so that the Owner can make all proper claims should future need develop.
- B. The Contractor shall furnish to the Owner's Representative for transmittal to the Owner, the name, address and telephone number of those persons responsible for service on systems and equipment covered by the warranty.

#### **1.17 OPERATION PRIOR TO ACCEPTANCE**

- A. When any equipment is operable, and it is to the advantage of the Contractor to operate the equipment, the Contractor may do so provided that he properly supervises the operation, and retains full responsibility for the equipment operated. Regardless of whether or not the equipment has or has not been operated, the Contractor shall clean the equipment properly, make required adjustments and complete punch list items before final acceptance by the Owner.

#### **1.18 INSTRUCTION OF OWNER'S PERSONNEL**

- A. Provide the services of competent engineers and/or technicians acceptable to the Owner's Representative to instruct other representatives of the Owner in the complete and detailed operation of each item of equipment or device of all the various electrical systems. These instructions shall be provided for whatever periods may be necessary to accomplish the desired results. Upon completion of these instructions, the Contractor shall obtain a letter of release, acknowledged by the Owner or his authorized representative, stating the dates on which the various kinds of instruction were given, and the personnel to whom the instructions were given.
- B. The Contractor shall be fully responsible for proper maintenance of equipment and systems until the instructions have been given to the Owner's personnel and the letter of release acknowledged.
- C. In providing the instructions to the Owner's personnel, the written operating and maintenance manuals shall be followed in all instances, and the Owner's personnel shall be familiarized with such manuals. Operating and maintenance manuals used for instructions shall include wiring diagrams, manufacturer's operating and maintenance instructions, parts lists (with sources identified), and other data as appropriate for each system.

#### **1.19 SCHEDULE AND SEQUENCE OF WORK**

- A. The Contractor shall meet and cooperate with the Owner and Owner's Representative to schedule and sequence this work so as to insure meeting scheduled completion dates and avoid delaying other portions of the work. Work requiring special sequencing shall be at no additional cost to the Owner and shall

have no impact on the schedule.

## **1.20 INSTALLATION INSPECTIONS AND CERTIFICATIONS**

- A. Obtain timely inspections of the installation by the regulatory authorities. Remedy any deficiencies to the satisfaction of the inspecting official.
- B. Upon final completion of the work, obtain certificates of acceptance from the regulatory authorities. Deliver the certificates to the Owner's Representative for transmission to the Owner.

## **1.21 EQUIPMENT INSTALLATION**

- A. Install equipment and devices in a manner to permit access to all surfaces or components, requiring such access, without the need to disassemble other unrelated parts of the work.
- B. Equipment specified to be factory assembled and tested prior to shipment shall not be disassembled at the job site and reassembled at its final location. Apparatus not so specified may be disassembled and reassembled in the proper location.
- C. Furnish all scaffolding, rigging and hoisting required for the installation of all the work.

## **1.22 CONCRETE HOUSEKEEPING PADS**

- A. Concrete housekeeping pads shall be provided for all floor mounted equipment, unless noted or required otherwise.
- B. All pads shall be not less than 3-1/2" high and extend a maximum 3" beyond the actual equipment size. Coordinate the proper size of the pad with the equipment furnished. Pads shall be poured in forms built of new dressed lumber with corners chamfered using sheet metal or triangular wood strips nailed to the form. Use 6 x 6 No. 3 mesh for reinforcing. Install heavy duty adjustable anchor bolts, set in the form and positioned using templates, prior to pouring concrete. After the equipment is set on the pad, the equipment shall be aligned, leveled and fully grouted to the pad and all void spaces shall be filled with a non-shrinking grout.
- C. Perform all concrete work specified to be provided under this Division in strict accordance with the applicable provisions of Division 3, CONCRETE.

## **1.23 SLEEVES**

- A. Each conduit, regardless of material, which passes through a concrete slab, masonry wall, or roof or portion of the building structure shall be free from the

structure and shall pass through a sleeve.

- B. All sleeves shall be constructed from electrical-metallic tubing or equivalent weight galvanized steel tubing and shall be flush on both sides of the surface penetrated, unless noted otherwise. All sleeves penetrating the roof areas shall extend a minimum 10 inches above the roof with approved weatherproof counterflashing attached to the conduit above the roof. All sleeves penetrating floors shall extend a minimum of 6 inches above the finished floors. The sleeves shall be sized to allow free passage of the conduit to be inserted.
- C. Sleeves passing through walls or floors on or below grade or in moist areas shall be constructed of galvanized rigid steel and shall be designed with a suitable flange in the center to form a waterproof passage. After the conduit has been installed in the sleeves, the void space around the conduit shall be caulked and filled with an asphalt-base compound to insure a waterproof penetration. Jute twine caulking shall not be used due to susceptibility to termite infestation.

#### **1.24 ESCUTCHEONS**

- A. In each finished space, provide a chromium plated, sectional escutcheon on each conduit, or hanger rod penetrating a wall, floor or ceiling.
- B. Size escutcheons and collars to fit snugly around conduit and rods.
- C. Where required, provide escutcheons with set screws so that they fit snugly against the finished surface.

#### **1.25 ACCESS PANELS**

- A. Provide wall and ceiling access panels for unrestricted access to all concealed electrical equipment items and devices installed behind furrings, chases or non-removable suspended ceilings.
- B. Access panels shall be UL listed and labeled as required to suit the fire rating of the surface in which installed, with mounting straps, concealed hinges, screwdriver locks, 180 degree open door design, 16 gauge steel construction and door and frame finished in prime coat finish. Panels shall be 12-inch by 12-inch minimum size, but shall be larger as the access requirement of the concealed electrical equipment item or device increases.

#### **1.26 SEALING OF PENETRATIONS**

- A. All penetrations in horizontal or vertical fire-rated construction shall be sealed using approved fire-rated sealing materials equivalent to the following:
  - 1 Foam: Dow Corning 3-6548 RTV silicone foam, liquid component Part 4 (black) and liquid component Part B (off-white).
  - 2 Sealant: Dow Corning 96-081 RTV silicone adhesive sealant.

- 3 Damming Materials: Mineral fiberboard, mineral fiber matting, mineral fiber putty, plywood or particle board, as selected by applicator.
- B. Preparation: Remove combustible materials and loose impediments from penetration opening and involved surfaces. Remove free liquid and oil from penetration surfaces.
- C. Installation: In accordance with manufacturer's instructions, install damming materials and sealant to cover and seal penetration openings; inject foam mixtures into openings.
- D. In addition to the Dow Corning products, equal products by Spec Seal Firestop Products, 3M Fire Barrier or CS240 Firestop are acceptable.

#### **1.27 PROTECTION OF APPARATUS**

- A. At all times take every precaution to properly protect apparatus from damage due to dust, dirt, water, etc. or from damage due to physical forces. Include the erection of temporary shelters as required, to adequately protect any apparatus stored at the site, the cribbing of any apparatus directly above the construction, and the covering of apparatus in the incomplete building with tarpaulins or other protective covering. Failure on the part of the Contractor to comply with the above to the entire satisfaction of the Owner's Representative will be sufficient cause for the rejection of the pieces of apparatus in question.
- B. Responsibility for the protection of apparatus extend also to existing apparatus involved in this Division of the work, whether such apparatus is designated to be used temporarily and later removed, or is to be reused as a part of the permanent installation. Erect temporary sheltering structures, provide temporary bracing and supports, or cover equipment as required or directed to afford proper protection for that equipment.
- C. The Contractor shall protect this work and the work of all other Contractors from damage by his work or workmen and shall make good any damage thus caused. He shall also be responsible for the proper protection of his equipment, machinery, materials and accessories delivered and installed on the job.

#### **1.28 INSTALLATION OF CONTROL AND OPERATING DEVICES**

- A. The highest operable part of controls (light switches, dimmer switches, emergency power off devices, etc.), receptacles (electrical and communications) and other operable devices shall be 48" above finish floor. The lowest operable part shall be no less than 15" above finished floor. For purposes of uniformity, unless noted otherwise, the top of a device shall be maximum 48" AFF and the bottom of a device shall be minimum 15" AFF. Refer to the electrical symbols list on the Drawings for specific requirements.
- B. Visual alarm appliances shall be placed 80" above finished floor (the highest floor level within a space) or 6" below the ceiling, whichever is lower.

### **1.29 INSTALLATION AND CONNECTION OF OTHER DIVISION'S EQUIPMENT**

- A. Verify the electrical requirements of all equipment furnished under other Divisions, separate contracts, or by the Owner. Install conduit, power wiring, control wiring, devices, etc. as required for complete operation of all equipment.

### **1.30 OPTION TO RELOCATE OUTLETS AND RELATED DEVICES**

- A. The location of power, data and telephone outlets, wall switches and other related devices may be relocated at the Owner's option, at no additional cost to the Owner, to a point within 10 feet of their present location provided the Contractor is notified prior to installation.

### **1.31 COOPERATION AND CLEAN-UP**

- A. It shall be the responsibility of the Contractor to cooperate fully to keep the job site in a clean and safe condition. Upon the completion of the job, the Contractor shall immediately remove all of his tools, equipment, surplus materials and debris.
- B. After the installation is complete, and before the equipment is energized, clean the interior and exterior of all equipment thoroughly. Clean equipment, removing all debris, rubbish and foreign materials. Each component shall be cleaned and all dust and other foreign material removed. Components shall be cleaned of oxidation. The inside and outside of all switchgear shall also be wiped clean with a lemon-oil rag after all other cleaning is complete.
- C. Any portion of the work requiring touch-up finishing shall be so finished to equal the specified finish on the product.

### **1.32 RECORD DRAWINGS AND DOCUMENTATION FOR OWNER**

- A. The Contractor shall obtain at his own expense a complete set of blue-line prints on which to keep an accurate record of the installation of all materials, equipment and devices covered by the Contract. The Contractor shall record up to date information at least once a week and retain the set of prints on site for periodic review by the Architect/Engineer. The record drawings shall indicate the location of all equipment and devices, and the routing of all systems. If the Contractor prepared large scale installation drawings of electrical rooms, conduit routing, busduct, routing, etc., these drawings or reproducible sepia's therefrom shall be revised as required to accurately illustrate the actual installation. All conduit buried in concrete slabs, walls and below grade shall be located by dimension; both horizontally and by vertical elevation, unless a surface mounted device in each space indicates the exact location.
- B. Upon anticipated completion of the job, obtain one complete reproducible set of the original drawings on which to neatly, legibly and accurately transfer all project related notations and deliver these record drawings to the Architect/Engineer at job completion before final payment and delivery to the Owner. This information shall be

delivered prior to final acceptance.

- C. The Contractor shall accumulate in duplicate during the job progress, the following data prepared in indexed 3-ring looseleaf, hard-back binders sized for 8-1/2 inch by 11 inch sheets. No binder shall exceed 3-1/2 inches thick. This data shall be turned over to the Owner's Representative for review and subsequent delivery to the Owner prior to final acceptance.
- 1 Warranties, guarantees and manufacturer's directions on material, equipment and devices covered by the Contract.
  - 2 Approved lighting fixture brochures, wiring diagrams and control diagrams.
  - 3 Copies of approved submittals and shop drawings.
  - 4 Operating instructions and recommended maintenance procedures for major apparatus.
  - 5 Copies of all other data and/or drawings required during construction.
  - 6 Repair parts list of major apparatus, including name, address and telephone number of local supplier or representative.
  - 7 Tag charts and diagrams hereinbefore specified.

### **1.33 FINAL OBSERVATION**

- A. The purpose of the final observation is to determine whether the Contractor has completed the construction in accordance with the Contract Documents and that in the Owner Representative's opinion the installation is satisfactory for final acceptance by the Owner.
- B. It shall be the responsibility of the Contractor to assure that the installation is ready for final acceptance prior to calling upon the Owner's Representative to make a final observation.

### **PART 2 - PRODUCTS (NOT USED)**

### **PART 3 - EXECUTION (NOT USED)**

**END OF SECTION**



**DIVISION 16050**  
**BASIC ELECTRICAL MATERIALS AND METHODS**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. This Section includes the following:
  - 1. Raceways.
  - 2. Building wire and connectors.
  - 3. Supporting devices for electrical components.
  - 4. Electrical identification.
  - 5. Electricity-metering components.
  - 6. Concrete equipment bases.
  - 7. Electrical demolition.
  - 8. Cutting and patching for electrical construction.
  - 9. Touchup painting.

**1.3 DEFINITIONS**

- A. EMT: Electrical metallic tubing.
- B. FMC: Flexible metal conduit.
- C. IMC: Intermediate metal conduit.
- D. LFMC: Liquidtight flexible metal conduit.
- E. RNC: Rigid nonmetallic conduit.

**1.4 SUBMITTALS**

- A. Product Data: For electricity-metering equipment.
- B. Shop Drawings: Dimensioned plans and sections or elevation layouts of electricity-metering equipment.

- C. Field Test Reports: Indicate and interpret test results for compliance with performance requirements.

## **1.5 QUALITY ASSURANCE**

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Comply with NFPA 70.

## **1.6 COORDINATION**

- A. Coordinate chases, slots, inserts, sleeves, and openings with general construction work and arrange in building structure during progress of construction to facilitate the electrical installations that follow.
  - 1. Set inserts and sleeves in poured-in-place concrete, masonry work, and other structural components as they are constructed.
- B. Sequence, coordinate, and integrate installing electrical materials and equipment for efficient flow of the Work. Coordinate installing large equipment requiring positioning before closing in the building.
- C. Coordinate electrical service connections to components furnished by utility companies.
  - 1. Coordinate installation and connection of exterior underground and overhead utilities and services, including provision for electricity-metering components.
  - 2. Comply with requirements of authorities having jurisdiction and of utility company providing electrical power and other services.
- D. Coordinate location of access panels and doors for electrical items that are concealed by finished surfaces. Access doors and panels are specified in Division 8 Section "Access Doors."
- E. Where electrical identification devices are applied to field-finished surfaces, coordinate installation of identification devices with completion of finished surface.
- F. Where electrical identification markings and devices will be concealed by acoustical ceilings and similar finishes, coordinate installation of these items before ceiling installation.

## **PART 2 - PRODUCTS**

### **2.1 EQUIPMENT FOR UTILITY COMPANY'S ELECTRICITY METERING**

- A. Current-Transformer Cabinets: Comply with requirements of electrical power utility company.

- B. Meter Sockets: Comply with requirements of electrical power utility company.
- C. Modular Meter Centers: Factory-coordinated assembly of a main meter center circuit-breaker unit with wireways, tenant meter socket modules, and tenant branch circuit breakers arranged in adjacent vertical sections, complete with interconnecting buses.
  - 1. Housing: NEMA 250, Type 3R enclosure.
  - 2. Tenant Branch Circuit Breakers: Series combination rated to protect circuit breakers in downstream panelboards that have 10,000-A interrupting capacity, minimum.

## **2.2 CONCRETE BASES**

- A. Concrete Forms and Reinforcement Materials: As specified in Division 3 Section "Cast-in-Place Concrete."
- B. Concrete: 3000-psi (20.7-MPa), 28-day compressive strength as specified in Division 3 Section "Cast-in-Place Concrete."

## **2.3 TOUCHUP PAINT**

- A. For Equipment: Equipment manufacturer's paint selected to match installed equipment finish.
- B. Galvanized Surfaces: Zinc-rich paint recommended by item manufacturer.

## **PART 3 - EXECUTION**

### **3.1 ELECTRICAL EQUIPMENT INSTALLATION**

- A. Headroom Maintenance: If mounting heights or other location criteria are not indicated, arrange and install components and equipment to provide the maximum possible headroom.
- B. Materials and Components: Install level, plumb, and parallel and perpendicular to other building systems and components, unless otherwise indicated.
- C. Equipment: Install to facilitate service, maintenance, and repair or replacement of components. Connect for ease of disconnecting, with minimum interference with other installations.
- D. Right of Way: Give to raceways and piping systems installed at a required slope.

### **3.2 RACEWAY AND CABLE INSTALLATION**

- A. Conceal raceways and cables, unless otherwise indicated, within finished walls, ceilings, and floors.

- B. Install raceways and cables at least 6 inches (150 mm) away from parallel runs of flues and steam or hot-water pipes. Locate horizontal raceway runs above water and steam piping.
- C. Use temporary raceway caps to prevent foreign matter from entering.
- D. Make conduit bends and offsets so ID is not reduced. Keep legs of bends in the same plane and straight legs of offsets parallel, unless otherwise indicated.
- E. Use raceway and cable fittings compatible with raceways and cables and suitable for use and location.
- F. Install raceways embedded in slabs in middle third of slab thickness where practical, and leave at least 1-inch (25-mm) concrete cover.
  - 1. Secure raceways to reinforcing rods to prevent sagging or shifting during concrete placement.
  - 2. Space raceways laterally to prevent voids in concrete.
  - 3. Install conduit larger than 1-inch trade size (DN27) parallel to or at right angles to main reinforcement. Where conduit is at right angles to reinforcement, place conduit close to slab support.
  - 4. Transition from nonmetallic tubing to Schedule 80 nonmetallic conduit, rigid steel conduit, or IMC before rising above floor.
  - 5. Make bends in exposed parallel or banked runs from same centerline to make bends parallel. Use factory elbows only where elbows can be installed parallel; otherwise, provide field bends for exposed parallel raceways.
- G. Install pull wires in empty raceways. Use No. 14 AWG zinc-coated steel or monofilament plastic line with not less than 200-lb (90-kg) tensile strength. Leave at least 12 inches (300 mm) of slack at each end of the pull wire.
- H. Install telephone and signal system raceways, 2-inch trade size (DN53) and smaller, in maximum lengths of 150 feet (45 m) and with a maximum of two 90-degree bends or equivalent. Separate lengths with pull or junction boxes where necessary to comply with these requirements, in addition to requirements above.
- I. Connect motors and equipment subject to vibration, noise transmission, or movement with a maximum of 72-inch (1830-mm) flexible conduit. Install LFMC in wet or damp locations. Install separate ground conductor across flexible connections.
- J. Set floor boxes level and trim after installation to fit flush to finished floor surface.

### **3.3 ELECTRICAL SUPPORTING DEVICE APPLICATION**

- A. Damp Locations and Outdoors: Hot-dip galvanized materials or nonmetallic, U-channel system components.

- B. Dry Locations: Steel materials.
- C. Support Clamps for PVC Raceways: Click-type clamp system.
- D. Selection of Supports: Comply with manufacturer's written instructions.
- E. Strength of Supports: Adequate to carry present and future loads, times a safety factor of at least four; minimum of 200-lb (90-kg) design load.

### **3.4 SUPPORT INSTALLATION**

- A. Install support devices to securely and permanently fasten and support electrical components.
- B. Install individual and multiple raceway hangers and riser clamps to support raceways. Provide U-bolts, clamps, attachments, and other hardware necessary for hanger assemblies and for securing hanger rods and conduits.
- C. Support parallel runs of horizontal raceways together on trapeze- or bracket-type hangers.
- D. Size supports for multiple raceway installations so capacity can be increased by a 25 percent minimum in the future.
- E. Support individual horizontal raceways with separate, malleable-iron pipe hangers or clamps.
- F. Install 1/4-inch- (6-mm-) diameter or larger threaded steel hanger rods, unless otherwise indicated.
- G. Spring-steel fasteners specifically designed for supporting single conduits or tubing may be used instead of malleable-iron hangers for 1-1/2-inch (38-mm) and smaller raceways serving lighting and receptacle branch circuits above suspended ceilings and for fastening raceways to slotted channel and angle supports.
- H. Arrange supports in vertical runs so the weight of raceways and enclosed conductors is carried entirely by raceway supports, with no weight load on raceway terminals.
- I. Simultaneously install vertical conductor supports with conductors.
- J. Separately support cast boxes that are threaded to raceways and used for fixture support. Support sheet-metal boxes directly from the building structure or by bar hangers. If bar hangers are used, attach bar to raceways on opposite sides of the box and support the raceway with an approved fastener not more than 24 inches (610 mm) from the box.
- K. Install metal channel racks for mounting cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices unless components are mounted directly to structural elements of adequate strength.

- L. Install sleeves for cable and raceway penetrations of concrete slabs and walls unless core-drilled holes are used. Install sleeves for cable and raceway penetrations of masonry and fire-rated gypsum walls and of all other fire-rated floor and wall assemblies. Install sleeves during erection of concrete and masonry walls.
- M. Securely fasten electrical items and their supports to the building structure, unless otherwise indicated. Perform fastening according to the following unless other fastening methods are indicated:
  - 1. Wood: Fasten with wood screws or screw-type nails.
  - 2. Masonry: Toggle bolts on hollow masonry units and expansion bolts on solid masonry units.
  - 3. New Concrete: Concrete inserts with machine screws and bolts.
  - 4. Existing Concrete: Expansion bolts.
  - 5. Instead of expansion bolts, threaded studs driven by a powder charge and provided with lock washers may be used in existing concrete.
  - 6. Steel: Welded threaded studs or spring-tension clamps on steel.
    - a. Field Welding: Comply with AWS D1.1.
  - 7. Welding to steel structure may be used only for threaded studs, not for conduits, pipe straps, or other items.
  - 8. Light Steel: Sheet-metal screws.
  - 9. Fasteners: Select so the load applied to each fastener does not exceed 25 percent of its proof-test load.

### **3.5 IDENTIFICATION MATERIALS AND DEVICES**

- A. Install at locations for most convenient viewing without interference with operation and maintenance of equipment.
- B. Coordinate names, abbreviations, colors, and other designations used for electrical identification with corresponding designations indicated in the Contract Documents or required by codes and standards. Use consistent designations throughout Project.
- C. Self-Adhesive Identification Products: Clean surfaces before applying.
- D. Identify raceways and cables with color banding as follows:
  - 1. Bands: Pretensioned, snap-around, colored plastic sleeves or colored adhesive marking tape. Make each color band 2 inches (51 mm) wide, completely encircling conduit, and place adjacent bands of two-color markings in contact, side by side.

2. Band Locations: At changes in direction, at penetrations of walls and floors, at 50-foot (15-m) maximum intervals in straight runs, and at 25-foot (8-m) maximum intervals in congested areas.
3. Colors: As follows:
  - a. Fire Alarm System: Red.
  - b. Security System: Blue and yellow.
  - c. Telecommunication System: Green and yellow.
- E. Tag and label circuits designated to be extended in the future. Identify source and circuit numbers in each cabinet, pull and junction box, and outlet box. Color-coding may be used for voltage and phase identification.
- F. Install continuous underground plastic markers during trench backfilling, for exterior underground power, control, signal, and communication lines located directly above power and communication lines. Locate 6 to 8 inches (150 to 200 mm) below finished grade. If width of multiple lines installed in a common trench or concrete envelope does not exceed 16 inches (400 mm), overall, use a single line marker.
- G. Color-code 208/120-V system secondary service, feeder, and branch-circuit conductors throughout the secondary electrical system as follows:
  1. Phase A: Black.
  2. Phase B: Red.
  3. Phase C: Blue.
  4. Neutral: White.
  5. Ground: Green.
- H. Color-code 480/277-V system secondary service, feeder, and branch-circuit conductors throughout the secondary electrical system as follows:
  1. Phase A: BROWN.
  2. Phase B: ORANGE.
  3. Phase C: YELLOW.
  4. Neutral: White with a colored stripe or gray.
  5. Ground: Green.
- I. Install warning, caution, and instruction signs where required to comply with 29 CFR, Chapter XVII, Part 1910.145, and where needed to ensure safe operation and maintenance of electrical systems and of items to which they connect. Install engraved plas-

tic-laminated instruction signs with approved legend where instructions are needed for system or equipment operation. Install metal-backed butyrate signs for outdoor items.

- J. Install engraved-laminated emergency-operating signs with white letters on red background with minimum 3/8-inch- (9-mm-) high lettering for emergency instructions on power transfer, load shedding, and other emergency operations.

### **3.6 UTILITY COMPANY ELECTRICITY-METERING EQUIPMENT**

- A. Install equipment according to utility company's written requirements. Provide grounding and empty conduits as required by utility company.

### **3.7 FIRESTOPPING**

- A. Apply firestopping to cable and raceway penetrations of fire-rated floor and wall assemblies to achieve fire-resistance rating of the assembly. Firestopping materials and installation requirements are specified in Division 7 Section "Firestopping."

### **3.8 CONCRETE BASES**

- A. Construct concrete bases of dimensions indicated, but not less than 4 inches (100 mm) larger, in both directions, than supported unit. Follow supported equipment manufacturer's anchorage recommendations and setting templates for anchor-bolt and tie locations, unless otherwise indicated. Use 3000-psi (20.7-MPa), 28-day compressive-strength concrete and reinforcement as specified in Division 3 Section "Cast-in-Place Concrete."

### **3.9 CUTTING AND PATCHING**

- A. Cut, channel, chase, and drill floors, walls, partitions, ceilings, and other surfaces required to permit electrical installations. Perform cutting by skilled mechanics of trades involved.
- B. Repair and refinish disturbed finish materials and other surfaces to match adjacent undisturbed surfaces. Install new fireproofing where existing firestopping has been disturbed. Repair and refinish materials and other surfaces by skilled mechanics of trades involved.

### **3.10 FIELD QUALITY CONTROL**

- A. Inspect installed components for damage and faulty work, including the following:
  1. Raceways.
  2. Building wire and connectors.
  3. Supporting devices for electrical components.
  4. Electrical identification.



5. Electricity-metering components.
  6. Concrete bases.
  7. Electrical demolition.
  8. Cutting and patching for electrical construction.
  9. Touchup painting.
- B. Test Owner's electricity-metering installation for proper operation, accuracy, and usability of output data.
1. Connect a load of known kW rating, 1.5 kW minimum, to a circuit supplied by the metered feeder.
  2. Turn off circuits supplied by the metered feeder and secure them in the "off" condition.
  3. Run the test load continuously for eight hours, minimum, or longer to obtain a measurable meter indication. Use a test load placement and setting that ensure continuous, safe operation.
  4. Check and record meter reading at end of test period and compare with actual electricity used based on test load rating, duration of test, and sample measurements of supply voltage at the test load connection. Record test results.
  5. Repair or replace malfunctioning metering equipment or correct test setup; then retest. Repeat for each meter in installation until proper operation of entire system is verified.

### **3.11 REFINISHING AND TOUCHUP PAINTING**

- A. Refinish and touch up paint. Paint materials and application requirements are specified in Division 9 Section "Painting."
1. Clean damaged and disturbed areas and apply primer, intermediate, and finish coats to suit the degree of damage at each location.
  2. Follow paint manufacturer's written instructions for surface preparation and for timing and application of successive coats.
  3. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
  4. Repair damage to PVC or paint finishes with matching touchup coating recommended by manufacturer.

### **3.12 CLEANING AND PROTECTION**

- A. On completion of installation, including outlets, fittings, and devices, inspect exposed finish. Remove burrs, dirt, paint spots, and construction debris.
- B. Protect equipment and installations and maintain conditions to ensure that coatings, finishes, and cabinets are without damage or deterioration at time of Substantial Completion.

**END OF SECTION**

**DIVISION 16055**  
**SITE ELECTRICAL**

**PART 1 GENERAL**

**1.1 RELATED REQUIREMENTS**

- A. The General Provisions, Supplemental General Provisions, Special Provisions and Division 1 Specification sections, apply to work covered by this Section.

**1.2 SCOPE OF WORK**

- A. Provide labor, materials, equipment, tools and services, and perform operations required for, and reasonably incidental to, the providing of all site electrical work.
- B. The site electrical work shall include, but not be limited to, the furnishing and installation of necessary materials and making arrangements for:
  - 1. The connection of electrical and telephone utilities.
  - 2. Underground conduit.

**1.3 SUBMITTALS**

- A. Submit product data and shop drawings in accordance with Division 1 for products specified under PARTS 2 PRODUCTS.

**1.4 REFERENCE STANDARDS**

- A. National Electrical Code (NEC), Article 300
- B. Service installation standards of the serving utility company(s).

**PART 2 PRODUCTS**

**2.1 ELECTRICAL SERVICE**

- A. Coordination: The location of the service entrance shall be coordinated with all other trades. Provide materials and equipment required to connect the electrical service. Contractor shall coordinate with the Power Company for all requirements prior to bid date. Contractor shall include all cost to for Utility Company to extend service to project site bid.
- B. Materials: Provide materials in accordance with other Sections of these Specifications.

**2.2 COMMUNICATION SERVICE**

A. Coordination: The location of the telephone, cable, and internet service entrance shall be coordinated with all other trades. Provide materials and equipment required to connect the telephone, cable and internet services. Contractor shall coordinate with the Telephone , cable, and internet company for all requirements prior to bid date. Contractor is responsible to coordinate with utility companies.

B. Materials: Provide materials in accordance with other sections of this specification.

### **PART 3 EXECUTION**

#### **3.1 GENERAL**

- A. Underground installation of more than one conduit shall be in a duct arrangement as indicated. All conduits shall be laid so joints are staggered. All bends and stub-ups shall be rigid steel.
- B. Pour a red colored concrete envelope 3" thick over utility service, emergency generator and fire pump conduits. Where conduits cross a driveway, road or parking area, reinforcing rods shall be installed.
- C. Perform excavation, shoring, backfilling and concrete work in connection with electrical work in accordance with other Divisions of the Specifications.
- D. All conduit shall be sloped away from the building to negate water entering the building through the conduit system.

#### **3.2 UTILITIES**

- A. The locations, elevations and voltage of electrical lines and the location of the telephone lines included within the area of this work are indicated on the Drawings or in the Specifications in accordance with information received by the Architect/Engineer and Owner.
- B. The Contractor shall examine the site and shall verify, to his own satisfaction, the location and elevation of all utilities, and shall adequately inform himself as to their relation to the work.
- C. Existing utility lines not indicated but encountered during construction shall be protected, relocated or capped as directed by the Architect/Engineer. All precautions shall be exercised to prevent damage to existing lines not shown, but should work become necessary, it must be authorized prior to execution except in an emergency situation.

- D. Before beginning excavations of any nature whatsoever, the Contractor shall make an attempt to locate all underground utilities of every nature occurring within the bounds of the area to be excavated. The Contractor shall then proceed with caution in his excavation work so that no utility shall be damaged with a resultant loss of service.
- E. Should a damage result to any utility through the Contractor's negligence or failure to comply with the above directive, he shall be liable for such damage and for all expense incurred in the expeditious repair or replacement of such damaged utilities.
- F. Repair of damaged utilities shall be to a condition equal to or better than the adjacent undamaged portion of such utility and to the complete satisfaction of the Architect/Engineer and Owner.

**END OF SECTION**

**DIVISION 16060**  
**GROUNDING AND BONDING**

**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 grounding and bonding of electrical systems and equipment. Grounding requirements specified in this Section may be supplemented by special requirements of systems described in other Sections.
- B. Related Sections include the following:
  - 1. Division 2 Section "Underground Ducts and Utility Structures" for ground test wells.

**1.3 SUBMITTALS**

- A. Product Data: For each type of product indicated.
- B. Product Data: For the following:
  - 1. Ground rods.
  - 2. Chemical rods.
- C. Qualification Data: For firms and persons specified in "Quality Assurance" Article.
- D. Field Test Reports: Submit written test reports to include the following:
  - 1. Test procedures used.
  - 2. Test results that comply with requirements.
  - 3. Results of failed tests and corrective action taken to achieve test results that comply with requirements.

**1.4 QUALITY ASSURANCE**

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
  - 1. Comply with UL 467.

- B. Comply with NFPA 70; for overhead-line construction and medium-voltage underground construction, comply with IEEE C2.
- C. Comply with NFPA 780 and UL 96 when interconnecting with lightning protection system.

## **PART 2 - PRODUCTS**

### **2.1 MANUFACTURERS**

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Grounding Conductors, Cables, Connectors, and Rods:
    - a. Apache Grounding/Erico Inc.
    - b. Boggs, Inc.
    - c. Chance/Hubbell.
    - d. Copperweld Corp.
    - e. Dossert Corp.
    - f. Erico Inc.; Electrical Products Group.
    - g. Framatome Connectors/Burndy Electrical.
    - h. Galvan Industries, Inc.
    - i. Hastings Fiber Glass Products, Inc.
    - j. Ideal Industries, Inc.
    - k. ILSCO.
    - l. Kearney/Cooper Power Systems.
    - m. Korn: C. C. Korn Co.; Division of Robroy Industries.
    - n. Lightning Master Corp.
    - o. Lyncole XIT Grounding.
    - p. O-Z/Gedney Co.; a business of the EGS Electrical Group.

- q. Raco, Inc.; Division of Hubbell.
- r. Robbins Lightning, Inc.
- s. Salisbury: W. H. Salisbury & Co.
- t. Superior Grounding Systems, Inc.
- u. Thomas & Betts, Electrical.

## **2.2 GROUNDING CONDUCTORS**

- A. For insulated conductors, comply with Division 16 Section "Conductors and Cables."
- B. Material: copper.
- C. Equipment Grounding Conductors: Insulated with green-colored insulation.
- D. Isolated Ground Conductors: Insulated with green-colored insulation with yellow stripe. On feeders with isolated ground, use colored tape, alternating bands of green and yellow tape to provide a minimum of three bands of green and two bands of yellow.
- E. Grounding Electrode Conductors: Stranded cable.
- F. Underground Conductors: stranded, unless otherwise indicated.
- G. Copper Bonding Conductors: As follows:
  - 1. Bonding Cable: 28 kcmil, 14 strands of No. 17 AWG copper conductor, 1/4 inch (6.4 mm) in diameter.
  - 2. Bonding Conductor: No. 4 or No. 6 AWG, stranded copper conductor.
  - 3. Bonding Jumper: Bare copper tape, braided bare copper conductors, terminated with copper ferrules; 1-5/8 inches (42 mm) wide and 1/16 inch (1.5 mm) thick.
  - 4. Tinned Bonding Jumper: Tinned-copper tape, braided copper conductors, terminated with copper ferrules; 1-5/8 inches (42 mm) wide and 1/16 inch (1.5 mm) thick.
- H. Ground Conductor and Conductor Protector for Wood Poles: As follows:
  - 1. No. 4 AWG minimum, soft-drawn copper conductor.
  - 2. Conductor Protector: Half-round PVC or wood molding. If wood, use pressure-treated fir, or cypress or cedar.
- I. Grounding Bus: Bare, annealed copper bars of rectangular cross section, with insulators.

## **2.3 CONNECTOR PRODUCTS**



- A. Comply with IEEE 837 and UL 467; listed for use for specific types, sizes, and combinations of conductors and connected items.
- B. Bolted Connectors: Bolted-pressure-type connectors, or compression type.
- C. Welded Connectors: Exothermic-welded type, in kit form, and selected per manufacturer's written instructions.

## **2.4 GROUNDING ELECTRODES**

- A. Ground Rods: Copper-clad steel.
  - 1. Size: 3/4 by 120 inches (19 by 3000 mm) in diameter.
- B. Chemical Electrodes: Copper tube, straight or L-shaped, filled with nonhazardous chemical salts, terminated with a 4/0 bare conductor. Provide backfill material recommended by manufacturer.
- C. Test Wells: Provide handholes as specified in Division 2 Section "Underground Ducts and Utility Structures."

## **PART 3 - EXECUTION**

### **3.1 APPLICATION**

- A. Use only copper conductors for both insulated and bare grounding conductors in direct contact with earth, concrete, masonry, crushed stone, and similar materials.
- B. In raceways, use insulated equipment grounding conductors.
- C. Exothermic-Welded Connections: Use for connections to structural steel and for underground connections, except those at test wells.
- D. Equipment Grounding Conductor Terminations: Use bolted pressure clamps.
- E. Ground Rod Clamps at Test Wells: Use bolted pressure clamps with at least two bolts.
- F. Grounding Bus: Install in electrical and telephone equipment rooms, in rooms housing service equipment, and elsewhere as indicated.
  - 1. Use insulated spacer; space 1 inch (25.4 mm) from wall and support from wall 6 inches (150 mm) above finished floor, unless otherwise indicated.
  - 2. At doors, route the bus up to the top of the door frame, across the top of the doorway, and down to the specified height above the floor.
- G. Underground Grounding Conductors: Use tinned copper conductor, No. 2/0 AWG minimum. Bury at least 24 inches (600 mm) below grade or bury 12 inches (300 mm) above duct bank when installed as part of the duct bank.

### **3.2 EQUIPMENT GROUNDING CONDUCTORS**

- A. Comply with NFPA 70, Article 250, for types, sizes, and quantities of equipment grounding conductors, unless specific types, larger sizes, or more conductors than required by NFPA 70 are indicated.
- B. Install equipment grounding conductors in all feeders and circuits.
- C. Install insulated equipment grounding conductor with circuit conductors for the following items, in addition to those required by NEC:
  - 1. Feeders and branch circuits.
  - 2. Lighting circuits.
  - 3. Receptacle circuits.
  - 4. Single-phase motor and appliance branch circuits.
  - 5. Three-phase motor and appliance branch circuits.
  - 6. Flexible raceway runs.
  - 7. Armored and metal-clad cable runs.
- D. Busway Supply Circuits: Install insulated equipment grounding conductor from the grounding bus in the switchgear, switchboard, or distribution panel to equipment grounding bar terminal on busway.
- E. Computer Outlet Circuits: Install insulated equipment grounding conductor in branch-circuit runs from computer-area power panels or power-distribution units.
- F. Isolated Grounding Receptacle Circuits: Install an insulated equipment grounding conductor connected to the receptacle grounding terminal. Isolate grounding conductor from raceway and from panelboard grounding terminals. Terminate at equipment grounding conductor terminal of the applicable derived system or service, unless otherwise indicated.
- G. Isolated Equipment Enclosure Circuits: For designated equipment supplied by a branch circuit or feeder, isolate equipment enclosure from supply raceway with a nonmetallic raceway fitting listed for the purpose. Install fitting where raceway enters enclosure, and install a separate equipment grounding conductor. Isolate equipment grounding conductor from raceway and from panelboard grounding terminals. Terminate at equipment grounding conductor terminal of the applicable derived system or service, unless otherwise indicated.
- H. Nonmetallic Raceways: Install an equipment grounding conductor in nonmetallic raceways unless they are designated for telephone or data cables.

- I. Air-Duct Equipment Circuits: Install an equipment grounding conductor to duct-mounted electrical devices operating at 120 V and more, including air cleaners and heaters. Bond conductor to each unit and to air duct.
- J. Water Heater, Heat-Tracing, and Antifrost Heating Cables: Install a separate equipment grounding conductor to each electric water heater, heat-tracing, and antifrost heating cable. Bond conductor to heater units, piping, connected equipment, and components.
- K. Signal and Communication Systems: For telephone, alarm, voice and data, and other communication systems, provide No. 4 AWG minimum insulated grounding conductor in raceway from grounding electrode system to each service location, terminal cabinet, wiring closet, and central equipment location.
  - 1. Service and Central Equipment Locations and Wiring Closets: Terminate grounding conductor on a 1/4-by-2-by-12-inch (6.4-by-50-by-300-mm) grounding bus.
  - 2. Terminal Cabinets: Terminate grounding conductor on cabinet grounding terminal.
- L. Metal Poles Supporting Outdoor Lighting Fixtures: Provide a grounding electrode in addition to installing a separate equipment grounding conductor with supply branch-circuit conductors.

### **3.3 INSTALLATION**

- A. Ground Rods: Install at least three rods spaced at least one-rod length from each other and located at least the same distance from other grounding electrodes.
  - 1. Drive ground rods until tops are 2 inches (50 mm) below finished floor or final grade, unless otherwise indicated.
  - 2. Interconnect ground rods with grounding electrode conductors. Use exothermic welds, except at test wells and as otherwise indicated. Make connections without exposing steel or damaging copper coating.
- B. Grounding Conductors: Route along shortest and straightest paths possible, unless otherwise indicated. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.
- C. Bonding Straps and Jumpers: Install so vibration by equipment mounted on vibration isolation hangers and supports is not transmitted to rigidly mounted equipment. Use exothermic-welded connectors for outdoor locations, unless a disconnect-type connection is required; then, use a bolted clamp. Bond straps directly to the basic structure taking care not to penetrate any adjacent parts. Install straps only in locations accessible for maintenance.
- D. Metal Water Service Pipe: Provide insulated copper grounding conductors, in conduit, from building's main service equipment, or grounding bus, to main metal water service

entrances to building. Connect grounding conductors to main metal water service pipes by grounding clamp connectors. Where a dielectric main water fitting is installed, connect grounding conductor to street side of fitting. Bond metal grounding conductor conduit or sleeve to conductor at each end.

- E. Water Meter Piping: Use braided-type bonding jumpers to electrically bypass water meters. Connect to pipe with grounding clamp connectors.
- F. Bond interior metal piping systems and metal air ducts to equipment grounding conductors of associated pumps, fans, blowers, electric heaters, and air cleaners. Use braided-type bonding straps.
- G. Bond each aboveground portion of gas piping system upstream from equipment shutoff valve.
- H. Install one test well for each service at the ground rod electrically closest to the service entrance. Set top of well flush with finished grade or floor.
- I. Ufer Ground (Concrete-Encased Grounding Electrode): Fabricate according to NFPA 70, Paragraph 250-81(c), using a minimum of 20 feet (6 m) of bare copper conductor not smaller than No. 4 AWG. If concrete foundation is less than 20 feet (6 m) long, coil excess conductor within the base of the foundation. Bond grounding conductor to reinforcing steel in at least four locations and to anchor bolts. Extend grounding conductor below grade and connect to building grounding grid or to a grounding electrode external to concrete.

### **3.4 CONNECTIONS**

- A. General: Make connections so galvanic action or electrolysis possibility is minimized. Select connectors, connection hardware, conductors, and connection methods so metals in direct contact will be galvanically compatible.
  - 1. Use electroplated or hot-tin-coated materials to ensure high conductivity and to make contact points closer to order of galvanic series.
  - 2. Make connections with clean, bare metal at points of contact.
  - 3. Make aluminum-to-steel connections with stainless-steel separators and mechanical clamps.
  - 4. Make aluminum-to-galvanized steel connections with tin-plated copper jumpers and mechanical clamps.
  - 5. Coat and seal connections having dissimilar metals with inert material to prevent future penetration of moisture to contact surfaces.
- B. Exothermic-Welded Connections: Comply with manufacturer's written instructions. Welds that are puffed up or that show convex surfaces indicating improper cleaning are not acceptable.

- C. Equipment Grounding Conductor Terminations: For No. 8 AWG and larger, use pressure-type grounding lugs. No. 10 AWG and smaller grounding conductors may be terminated with winged pressure-type connectors.
- D. Noncontact Metal Raceway Terminations: If metallic raceways terminate at metal housings without mechanical and electrical connection to housing, terminate each conduit with a grounding bushing. Connect grounding bushings with a bare grounding conductor to grounding bus or terminal in housing. Bond electrically noncontinuous conduits at entrances and exits with grounding bushings and bare grounding conductors, unless otherwise indicated.
- E. Connections at Test Wells: Use compression-type connectors on conductors and make bolted- and clamped-type connections between conductors and ground rods.
- F. Tighten screws and bolts for grounding and bonding connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.
- G. Compression-Type Connections: Use hydraulic compression tools to provide correct circumferential pressure for compression connectors. Use tools and dies recommended by connector manufacturer. Provide embossing die code or other standard method to make a visible indication that a connector has been adequately compressed on grounding conductor.
- H. Moisture Protection: If insulated grounding conductors are connected to ground rods or grounding buses, insulate entire area of connection and seal against moisture penetration of insulation and cable.

### **3.5 FIELD QUALITY CONTROL**

- A. Testing: Owner will engage a qualified testing agency to perform the following field quality-control testing:
- B. Testing: Engage a qualified testing agency to perform the following field quality-control testing:
- C. Testing: Perform the following field quality-control testing:
  - 1. After installing grounding system but before permanent electrical circuitry has been energized, test for compliance with requirements.
  - 2. Test completed grounding system at each location where a maximum ground-resistance level is specified, at service disconnect enclosure grounding terminal, and at ground test wells. Measure ground resistance not less than two full days after the last trace of precipitation, and without the soil being moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance. Perform tests, by the fall-of-potential method according to IEEE 81.

3. Provide drawings locating each ground rod and ground rod assembly and other grounding electrodes, identify each by letter in alphabetical order, and key to the record of tests and observations. Include the number of rods driven and their depth at each location and include observations of weather and other phenomena that may affect test results. Describe measures taken to improve test results.
  - a. Equipment Rated 500 kVA and Less: 10 ohms.
  - b. Equipment Rated 500 to 1000 kVA: 5 ohms.
  - c. Equipment Rated More Than 1000 kVA: 3 ohms.
  - d. Substations and Pad-Mounted Switching Equipment: 5 ohms.
  - e. Manhole Grounds: 10 ohms.
4. Excessive Ground Resistance: If resistance to ground exceeds specified values, notify Architect promptly and include recommendations to reduce ground resistance.

### **3.6 GRADING AND PLANTING**

- A. Restore surface features, including vegetation, at areas disturbed by Work of this Section. Reestablish original grades, unless otherwise indicated. If sod has been removed, replace it as soon as possible after backfilling is completed. Restore areas disturbed by trenching, storing of dirt, cable laying, and other activities to their original condition. Include application of topsoil, fertilizer, lime, seed, sod, sprig, and mulch. Comply with Division 2 Section "Landscaping." Maintain restored surfaces. Restore disturbed paving as indicated.

**END OF SECTION**

**DIVISION 16075**  
**ELECTRICAL IDENTIFICATION**

**PART 1 GENERAL**

**1.1 RELATED REQUIREMENTS**

- A. The General Provisions, Supplemental General Provisions, Special Provisions and Division 1 Specification sections, apply to work covered by this Section.
- B. Comply with Division 16 Sections, as applicable. Refer to other Divisions for coordination of work.

**1.2 SCOPE OF WORK**

- A. Provide labor, material, equipment, tools and services, and perform operations required for, and reasonably incidental to, the providing of electrical identification, including related accessories.
- B. Provide electrical identification for the following:
  - 1. Panelboards, motor starters, contactors, disconnect switches, circuit breakers and other electrical equipment with nameplate identifying the item of equipment and the equipment serving the same.
  - 2. Raceways, junction boxes and pull boxes.
    - 1. Label each panelboard index indicating the room #s to the related circuit. Also add the index sheet in a laminated white core, plastic with beveled edges, minimum 1/16 inch thick. Lettering shall be machine-engraved, not less than 1/4" high, cut through the black or red surface to the white core.
  - 3. Wiring devices.
  - 4. Wiring.
  - 5. Three phase motor rotation.

**1.3 SUBMITTALS**

- A. Submit product data in accordance with Division 1 for products specified under PART 2 - PRODUCTS.

**PART 2 PRODUCTS**

**2.1 ACCEPTABLE MANUFACTURERS**

- B. Brady
- C. Panduit
- D. Thomas & Betts

E. Seton

2.2 IDENTIFICATION

A. Nameplates

1. Nameplates shall be black engraved surface on white core for normal power circuits and red engraved surface on white core for emergency power circuits.
2. Provide for each distribution panelboard, branch circuit panelboard, transformer and any other similar equipment furnished under this Division identification as to its given name, voltage and origination of service. Examples are as follows:

'LB'	'HD'
480Y/277V	480Y/277V
FED FROM 'MDP'	FED FROM 'MDP'

'RDP'	'TX-R'
208Y/120V	300 KVA, 480V to
FED FROM TX-R	208Y/120V
FED FROM	'MDP'

3. Provide for each motor starter enclosure, circuit breaker enclosure, disconnect switch and any other similar equipment furnished under this Division, identification as to the specific load that it serves and the origination of service. Examples are as follows:

'CH-1'	'AHU-1'
FED FROM 'MDP'	FED FROM 'DPA'

4. Provide for each feeder protective device in each distribution panelboard and any other similar equipment furnished under this Division, identification as to the specific load that it serves.
5. Nameplates shall be laminated, white core, plastic with beveled edges, minimum 1/16 inch thick. Lettering shall be machine-engraved, not less than 1/4" high, cut through the black or red surface to the white core.

B. Junction Boxes and Pull Boxes

1. Identification shall be with a black permanent marking pen on the top of 4" x 4" junction box covers or on the back of an outlet box cover plate identifying the branch circuits and systems



within the conduit. Pull boxes shall be provided with a nameplate stating voltage and system served.

C. Wiring Device Wall Plates

1. On the back side of wiring device wall plates identify with a black permanent marking pen the panelboard and branch circuit number the device is served from.

D. Wire Markers

1. Wire markers for identification of wiring shall be self-adhesive type having letters and numerals indicating serving equipment and feeder or branch circuit number.

F. Rotation Tags

1. Rotation tags shall be brass or aluminum securely attached to equipment.

## **PART 3 EXECUTION**

### **3.1 PREPARATION**

- A. Surfaces to receive labels or nameplates shall be carefully prepared in accordance with the manufacturer's instructions and recommendations.

### **3.2 NAMEPLATES**

- A. Nameplates shall be properly attached to identify panelboards, feeder circuit breakers, disconnect switches, pull boxes and other similar equipment furnished under this Division.

### **3.3 WIRE MARKERS**

- A. Wire markers shall be applied to each conductor or cable within panelboards, motor starter enclosures, circuit breaker enclosures, disconnect switches, cabinets, junction boxes, pull boxes, and other similar equipment identifying the serving equipment and feeder or branch circuit from which the conductors originate.

**END OF SECTION**

**DIVISION 16120**  
**BUILDING WIRE AND CABLE**

**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 building wires and cables and associated connectors, splices, and terminations for wiring systems rated 600 V and less.

**1.3 SUBMITTALS**

- A. Field Test Reports: Indicate and interpret test results for compliance with performance requirements.

**1.4 QUALITY ASSURANCE**

- A. Listing and Labeling: Provide wires and cables specified in this Section that are listed and labeled.

- 1. The Terms "Listed" and "Labeled": As defined in NFPA 70, Article 100.

- B. Comply with NFPA 70.

**1.5 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver wires and cables according to NEMA WC 26.

**1.6 COORDINATION**

- A. Coordinate layout and installation of cables with other installations.
- B. Revise locations and elevations from those indicated, as required to suit field conditions and as approved by Architect.

## **PART 2 - PRODUCTS**

### **2.1 MANUFACTURERS**

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Wires and Cables:

a. American Insulated Wire Corp.; Leviton Manufacturing Co.

b. BICC Brand-Rex Company.

c. Carol Cable Co., Inc.

d. Senator Wire & Cable Company.

e. Southwire Company.

2. Connectors for Wires and Cables:

a. AMP Incorporated.

b. General Signal; O-Z/Gedney Unit.

c. Monogram Co.; AFC.

d. Square D Co.; Anderson.

e. 3M Company; Electrical Products Division.

## **2.2 BUILDING WIRES AND CABLES**

- A. UL-listed building wires and cables with conductor material, insulation type, cable construction, and rating as specified in Part 3 "Wire and Insulation Applications" Article.
- B. Rubber Insulation Material: Comply with NEMA WC 3.
- C. Thermoplastic Insulation Material: Comply with NEMA WC 5.
- D. Ethylene Propylene Rubber Insulation Material: Comply with NEMA WC 8.
- E. Conductor Material: Copper.
- F. Stranding: Solid conductor for No. 10 AWG and smaller; stranded conductor for larger than No. 10 AWG.
- G. Plenum rated cable for all cables above the ceiling.

## **2.3 CONNECTORS AND SPLICES**

- A. UL-listed, factory-fabricated wiring connectors of size, ampacity rating, material, type, and class for application and service indicated. Comply with Project's installation requirements and as specified in Part 3 "Wire and Insulation Applications" Article.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Examine raceways and building finishes to receive wires and cables for compliance with requirements for installation tolerances and other conditions affecting performance of wires and cables. Do not proceed with installation until unsatisfactory conditions have been corrected.

### **3.2 WIRE AND INSULATION APPLICATIONS**

- A. Service Entrance: Type RHW or THWN, in raceway.

- B. Feeders: Type 75C insulation THHN/THWN, in raceway.
- C. Fire-Pump Feeder: Type MI, 3-conductor.
- D. Branch Circuits: Type THHN/THWN, in raceway.
- E. Fire Alarm Circuits: Type THHN/THWN, in raceway.
- F. Class 1 Control Circuits: Type THHN/THWN, in raceway.
- G. Class 2 Control Circuits: Type THHN/THWN, in raceway.
- H. Equipment or any device rated 100 amperes or less, conductor shall be rated 60C as per National Electrical Code.
- I. Equipment or any device rated over 100 amperes, conductor shall be rated 75C as per National Electrical Code.

### **3.3 INSTALLATION**

- A. Install wires and cables as indicated, according to manufacturer's written instructions and NECA's "Standard of Installation."
- B. Remove existing wires from raceway before pulling in new wires and cables.
- C. Pull Conductors: Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
- D. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.
- E. Install exposed cables, parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.
- F. Support cables according to Division 16 Section "Basic Electrical Materials and Methods."

- G. Seal around cables penetrating fire-rated elements according to Division 7 Section "Firestopping."
- H. Identify wires and cables according to Division 16 Section "Basic Electrical Materials and Methods."
- I. Identify wires and cables according to Division 16 Section "Electrical Identification."

### **3.4 CONNECTIONS**

- A. Conductor Splices: Keep to minimum.
- B. Install splices and tapes that possess equivalent or better mechanical strength and insulation ratings than conductors being spliced.
- C. Use splice and tap connectors compatible with conductor material.
- D. Use oxide inhibitor in each splice and tap connector for aluminum conductors.
- E. Wiring at Outlets: Install conductor at each outlet, with at least 12 inches (300 mm) of slack.
- F. Connect outlets and components to wiring and to ground as indicated and instructed by manufacturer.
- G. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

### **3.5 FIELD QUALITY CONTROL**

- A. Testing: On installation of wires and cables and before electrical circuitry has been energized, demonstrate product capability and compliance with requirements.
  - 1. Procedures: Perform each visual and mechanical inspection and electrical test stated in NETA ATS, Section 7.3.1. Certify compliance with test parameters.
- B. Correct malfunctioning conductors and cables at Project site, where possible, and retest to demonstrate compliance; otherwise, remove and replace with new units and retest.

**END OF SECTION**

**DIVISION 16130**  
**RACEWAYS AND BOXES**

**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 raceways, fittings, boxes, enclosures, and cabinets for electrical wiring.

- 1. Raceways include the following:
  - a. RMC.
  - b. IMC.
  - c. PVC externally coated, rigid steel conduits.
  - d. PVC externally coated, IMC.
  - e. EMT.
  - f. FMC.
  - g. LFMC.
  - h. LFNC.
  - i. RNC.
  - j. ENT.
  - k. Wireways.
  - l. Surface raceways.
- 2. Boxes, enclosures, and cabinets include the following:
  - a. Device boxes.
  - b. Floor boxes.
  - c. Outlet boxes.
  - d. Pull and junction boxes.



e. Cabinets and hinged-cover enclosures.

B. Related Sections include the following:

1. Division 16 Section "Basic Electrical Materials and Methods" for raceways and box supports.
2. Division 16 Section "Wiring Devices" for devices installed in boxes and for floor-box service fittings.

### **1.3 DEFINITIONS**

- A. EMT: Electrical metallic tubing.
- B. ENT: Electrical nonmetallic tubing.
- C. FMC: Flexible metal conduit.
- D. IMC: Intermediate metal conduit.
- E. LFMC: Liquidtight flexible metal conduit.
- F. LFNC: Liquidtight flexible nonmetallic conduit.
- G. RMC: Rigid metal conduit.
- H. RNC: Rigid nonmetallic conduit.

### **1.4 SUBMITTALS**

- A. Product Data: For surface raceways, wireways and fittings, floor boxes, hinged-cover enclosures, and cabinets.
- B. Shop Drawings: Include layout drawings showing components and wiring for non-standard boxes, enclosures, and cabinets.

### **1.5 QUALITY ASSURANCE**

- A. Listing and Labeling: Provide raceways and boxes specified in this Section that are listed and labeled.
  1. The Terms "Listed" and "Labeled": As defined in NFPA 70, Article 100.
  2. Listing and Labeling Agency Qualifications: A "Nationally Recognized Testing Laboratory" as defined in OSHA Regulation 1910.7.
- B. Comply with NECA's "Standard of Installation."
- C. Comply with NFPA 70.

## **1.6 COORDINATION**

- A. Coordinate layout and installation of raceways and boxes with other construction elements to ensure adequate headroom, working clearance, and access.

## **PART 2 - PRODUCTS**

### **2.1 MANUFACTURERS**

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Metal Conduit and Tubing:
    - a. Alfex Corp.
    - b. Anamet, Inc.; Anaconda Metal Hose.
    - c. Anixter Brothers, Inc.
    - d. Carol Cable Co., Inc.
    - e. Cole-Flex Corp.
    - f. Electri-Flex Co.
    - g. Flexcon, Inc.; Coleman Cable Systems, Inc.
    - h. Grinnell Co.; Allied Tube and Conduit Div.
    - i. Monogram Co.; AFC.
    - j. Spiraduct, Inc.
    - k. Triangle PWC, Inc.
    - l. Wheatland Tube Co.
  - 2. Nonmetallic Conduit and Tubing:
    - a. Anamet, Inc.; Anaconda Metal Hose.
    - b. Arnco Corp.
    - c. Breeze-Illinois, Inc.

- d. Cantex Industries; Harsco Corp.
  - e. Certainteed Corp.; Pipe & Plastics Group.
  - f. Cole-Flex Corp.
  - g. Condux International; Electrical Products.
  - h. Electri-Flex Co.
  - i. George-Ingraham Corp.
  - j. Hubbell, Inc.; Raco, Inc.
  - k. Lamson & Sessions; Carlon Electrical Products.
  - l. R&G Sloan Manufacturing Co., Inc.
  - m. Spiraduct, Inc.
  - n. Thomas & Betts Corp.
3. Conduit Bodies and Fittings:
- a. American Electric; Construction Materials Group.
  - b. Crouse-Hinds; Div. of Cooper Industries.
  - c. Emerson Electric Co.; Appleton Electric Co.
  - d. Hubbell, Inc.; Killark Electric Manufacturing Co.
  - e. Lamson & Sessions; Carlon Electrical Products.
  - f. O-Z/Gedney; Unit of General Signal.
  - g. Scott Fetzer Co.; Adalet-PLM.
  - h. Spring City Electrical Manufacturing Co.
4. Metal Wireways:
- a. Hoffman Engineering Co.
  - b. Keystone/Rees, Inc.
  - c. Square D Co.

## **2.2 METAL CONDUIT AND TUBING**

- A. Rigid Steel Conduit: ANSI C80.1.
- B. Rigid Aluminum Conduit: ANSI C80.5.
- C. IMC: ANSI C80.6.
- D. EMT and Fittings: ANSI C80.3.
  - 1. Fittings: Set-screw type.
- E. Fittings: NEMA FB 1; compatible with conduit/tubing materials.

### **2.3 NONMETALLIC CONDUIT AND TUBING**

- A. RNC: NEMA TC 2, Schedule 40 or 80 PVC.
- B. RNC Fittings: NEMA TC 3; match to conduit or conduit/tubing type and material.
- C. LFNC: UL 1660.

### **2.4 METAL WIREWAYS**

- A. Material: Sheet metal sized and shaped as indicated.
- B. Fittings and Accessories: Include couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings to match and mate with wireways as required for complete system.
- C. Select features, unless otherwise indicated, as required to complete wiring system and to comply with NFPA 70.
- D. Wireway Covers: Screw – cover type flanged-and-gasketed type.
- E. Finish: Manufacturer's standard enamel finish.

### **2.5 OUTLET AND DEVICE BOXES**

- A. Sheet Metal Boxes: NEMA OS 1.
- B. Cast-Metal Boxes: NEMA FB 1, Type FD, cast box with gasketed cover.

### **2.6 PULL AND JUNCTION BOXES**

- A. Small Sheet Metal Boxes: NEMA OS 1.
- B. Cast-Metal Boxes: NEMA FB 1, cast aluminum with gasketed cover.

### **2.7 ENCLOSURES AND CABINETS**

- A. Hinged-Cover Enclosures: NEMA 250, Type 1, with continuous hinge cover and flush latch.
  - 1. Metal Enclosures: Steel, finished inside and out with manufacturer's standard enamel.
  - 2. Nonmetallic Enclosures: Plastic, finished inside with radio-frequency-resistant paint.
- B. Cabinets: NEMA 250, Type 1, galvanized steel box with removable interior panel and removable front, finished inside and out with manufacturer's standard enamel. Hinged door in front cover with flush latch and concealed hinge. Key latch to match panelboards. Include metal barriers to separate wiring of different systems and voltage, and include accessory feet where required for freestanding equipment.

### **PART 3 - EXECUTION**

#### **3.1 EXAMINATION**

- A. Examine surfaces to receive raceways, boxes, enclosures, and cabinets for compliance with installation tolerances and other conditions affecting performance of raceway installation. Do not proceed with installation until unsatisfactory conditions have been corrected.

#### **3.2 WIRING METHODS**

- A. Outdoors: Use the following wiring methods:
  - 1. Exposed: Rigid steel.
  - 2. Concealed: Rigid steel.
  - 3. Underground, Single Run: RNC.
  - 4. Underground, Grouped: RNC.
  - 5. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.
  - 6. Boxes and Enclosures: NEMA 250, Type 3R .
- B. Indoors: Use the following wiring methods:
  - 1. Exposed: EMT.
  - 2. Concealed: EMT.
  - 3. Underground, Single Run: RNC.
  - 4. Underground, Grouped: RNC

5. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): FMC; except in wet or damp locations, use LFMC.
6. Damp or Wet Locations: Rigid steel conduit.
7. Boxes and Enclosures: NEMA 250, Type 1, except as follows:
  - a. Damp or Wet Locations: NEMA 250, Type 4, stainless steel.

### **3.3 INSTALLATION**

- A. Install raceways, boxes, enclosures, and cabinets as indicated, according to manufacturer's written instructions.
- B. Minimum Raceway Size: 3/4-inch trade size (DN21).
- C. Conceal conduit and EMT, unless otherwise indicated, within finished walls, ceilings, and floors.
- D. Keep raceways at least 6 inches (150 mm) away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.
- E. Install raceways level and square and at proper elevations. Provide adequate headroom.
- F. Complete raceway installation before starting conductor installation.
- G. Support raceways as specified in Division 16 Section "Basic Electrical Materials and Methods."
- H. Use temporary closures to prevent foreign matter from entering raceways.
- I. Protect stub-ups from damage where conduits rise through floor slabs. Arrange so curved portion of bends is not visible above the finished slab.
- J. Make bends and offsets so ID is not reduced. Keep legs of bends in the same plane and straight legs of offsets parallel, unless otherwise indicated.
- K. Use raceway fittings compatible with raceways and suitable for use and location. For intermediate steel conduit, use threaded rigid steel conduit fittings, unless otherwise indicated.
- L. Run concealed raceways, with a minimum of bends, in the shortest practical distance considering the type of building construction and obstructions, unless otherwise indicated.
- M. Raceways Embedded in Slabs (Must be indicated on drawings to be embedded. Please notify Engineer if required but not shown): Install in middle third of slab thickness where practical, and leave at least 1-inch (25-mm) concrete cover.

1. Secure raceways to reinforcing rods to prevent sagging or shifting during concrete placement.
  2. Space raceways laterally to prevent voids in concrete.
  3. Run conduit larger than 1-inch trade size (DN27) parallel to or at right angles to main reinforcement. Where at right angles to reinforcement, place conduit close to slab support.
  4. Transition from nonmetallic tubing to Schedule 80 nonmetallic conduit, rigid steel conduit, or IMC before rising above floor.
- N. Install exposed raceways parallel to or at right angles to nearby surfaces or structural members, and follow the surface contours as much as practical.
1. Run parallel or banked raceways together, on common supports where practical.
  2. Make bends in parallel or banked runs from same centerline to make bends parallel. Use factory elbows only where elbows can be installed parallel; otherwise, provide field bends for parallel raceways.
- O. Join raceways with fittings designed and approved for the purpose and make joints tight.
1. Make raceway terminations tight. Use bonding bushings or wedges at connections subject to vibration. Use bonding jumpers where joints cannot be made tight.
  2. Use insulating bushings to protect conductors.
- P. Tighten set screws of threadless fittings with suitable tools.
- Q. Terminations: Where raceways are terminated with locknuts and bushings, align raceways to enter squarely and install locknuts with dished part against the box. Where terminations are not secure with 1 locknut, use 2 locknuts: 1 inside and 1 outside the box.
- R. Where raceways are terminated with threaded hubs, screw raceways or fittings tightly into the hub so the end bears against the wire protection shoulder. Where chase nipples are used, align raceways so the coupling is square to the box and tighten the chase nipple so no threads are exposed.
- S. Install pull wires in empty raceways. Use No. 14 AWG zinc-coated steel or monofilament plastic line with not less than 200-lb (90-kg) tensile strength. Leave at least 12 inches (300 mm) of slack at each end of the pull wire.
- T. Telephone and Signal System Raceways, 2-Inch Trade Size (DN53) and Smaller: In addition to the above requirements, install raceways in maximum lengths of 150 feet

(45 m) and with a maximum of two 90-degree bends or equivalent. Separate lengths with pull or junction boxes where necessary to comply with these requirements.

- U. Install raceway sealing fittings according to manufacturer's written instructions. Locate fittings at suitable, approved, and accessible locations and fill them with UL-listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings at the following points:
  - 1. Where conduits pass from warm to cold locations, such as the boundaries of refrigerated spaces.
  - 2. Where otherwise required by NFPA 70.
- V. Stub-up Connections: Extend conduits through concrete floor for connection to free-standing equipment. Install with an adjustable top or coupling threaded inside for plugs set flush with the finished floor. Extend conductors to equipment with rigid steel conduit; FMC may be used 6 inches (150 mm) above the floor. Install screwdriver-operated, threaded flush plugs flush with floor for future equipment connections.
- W. Flexible Connections: Use maximum of 6 feet (1830 mm) of flexible conduit for recessed and semirecessed lighting fixtures; for equipment subject to vibration, noise transmission, or movement; and for all motors. Use liquidtight flexible conduit in wet or damp locations. Install separate ground conductor across flexible connections.
- X. Install nonferrous conduit or tubing for circuits operating above 60 Hz. Where aluminum raceways are installed for such circuits and pass through concrete, install in a nonmetallic sleeve.
- Y. Do not install aluminum conduits embedded in or in contact with concrete.
- Z. PVC Externally Coated, Rigid Steel Conduits: Use only fittings approved for use with that material. Patch all nicks and scrapes in PVC coating after installing conduits.
- AA. Surface Raceways: Install a separate, green, ground conductor in raceways from junction box supplying the raceways to receptacle or fixture ground terminals.
  - 1. Select each surface raceway outlet box, to which a lighting fixture is attached, of sufficient diameter to provide a seat for the fixture canopy.
  - 2. Where a surface raceway is used to supply a fluorescent lighting fixture having central-stem suspension with a backplate and a canopy (with or without extension ring), no separate outlet box is required.
  - 3. Provide surface metal raceway outlet box, and the backplate and canopy, at the feed-in location of each fluorescent lighting fixture having end-stem suspension.



4. Where a surface metal raceway extension is made from an existing outlet box on which a lighting fixture is installed, no additional surface-mounted outlet box is required. Provide a backplate slightly smaller than the fixture canopy.
- BB. Set floor boxes level and adjust to finished floor surface.
- CC. Set floor boxes level and trim after installation to fit flush to finished floor surface.
- DD. Install hinged-cover enclosures and cabinets plumb. Support at each corner.
- EE. NO PVC CONDUIT ALLOWED ABOVE THE CEILING OR IN THE A/C RETURN PLENUM. PROVIDE RIGID CONDUIT. Verify all MEP documents.**

### **3.4 PROTECTION**

- A. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure coatings, finishes, and cabinets are without damage or deterioration at the time of Substantial Completion.
  1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
  2. Repair damage to PVC or paint finishes with matching touchup coating recommended by manufacturer.

### **3.5 CLEANING**

- A. On completion of installation, including outlet fittings and devices, inspect exposed finish. Remove burrs, dirt, and construction debris and repair damaged finish, including chips, scratches, and abrasions.

**END OF SECTION**

**DIVISION 16140**  
**WIRING DEVICES**

**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 receptacles, connectors, switches, and finish plates.

**1.3 DEFINITIONS**

- A. GFI: Ground-fault circuit interrupter.
- B. TVSS: Transient voltage surge suppressor.

**1.4 SUBMITTALS**

- A. Product Data: For each product specified.
- B. Shop Drawings: Legends for receptacles and switch plates.
- C. Samples: For devices and device plates for color selection and evaluation of technical features.
- D. Maintenance Data: For materials and products to include in maintenance manuals specified in Division 1.

**1.5 QUALITY ASSURANCE**

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction.
- B. Comply with NEMA WD 1.
- C. Comply with NFPA 70.

**1.6 COORDINATION**

- A. Receptacles for Owner-Furnished Equipment: Match plug configurations.
- B. Coordinate with pool contractor for special receptacles.

**PART 2 - PRODUCTS**

**2.1 MANUFACTURERS**

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Wiring Devices:
    - a. Bryant Electric, Inc.
    - b. Eagle Electric Manufacturing Co., Inc.
    - c. GE Company; GE Wiring Devices.
    - d. Hubbell, Inc.; Wiring Devices Div.
    - e. Killark Electric Manufacturing Co.
    - f. Leviton Manufacturing Co., Inc.
    - g. Pass & Seymour/Legrand; Wiring Devices Div.
    - h. Pyle-National, Inc.; an Amphenol Co.

## **2.2 RECEPTACLES**

- A. Straight-Blade and Locking Receptacles: Heavy-Duty grade. The device shall be 20-ampere, 125-volts, Nema configuration 5-20R, back and side wired.
- B. Special Receptacles for NEMA configuration refer to Manufacturer specs.
- C. GFI Receptacles: Feed-through type, with integral NEMA WD 6, Configuration 5-20R duplex receptacle arranged to protect connected downstream receptacles on same circuit. Design units for installation in a 2-3/4-inch- (70-mm-) deep outlet box without an adapter. Device shall have an indicator light.

## **2.3 SWITCHES**

- A. General
  - 1. Switches shall be toggle or decorative rocker type as indicated herein.. The body of the switch shall be made of an arc-resistant thermoset material. All toggle switch handles shall be constructed of a thermoplastic material. All rocker switch handles shall be constructed of a thermoset material. All wall switches shall be of the quiet AC type.
  - 1. Switches shall be SPST, DPST, 3-way or 4-way as indicated on the Drawings.
  - 2. Switch color shall be white unless noted otherwise. Coordinate with Architect.

B. Specification Grade

1. Specification Grade switches shall be toggle type. The contact arms shall be made of one-piece copper alloy material. The switch shall include a green ground screw attached to the mounting strap. The switch shall be 20-ampere, 120/277-volts AC, horsepower rated, back and side-wired.

**2.4 WALL PLATES(All wall plates)**

- A. For all single and combination types match corresponding wiring devices.
1. Plate-Securing Screws: Metal with head color to match plate finish.
  2. Material for Finished Spaces: 0.04-inch- (1-mm-) thick, Type 302, satin-finished stainless steel.
  3. Material for Unfinished Spaces: stainless steel.

**PART 3 - EXECUTION**

**3.1 INSTALLATION**

- A. Install devices and assemblies plumb and secure.
- B. Install wall plates when painting is complete.
- C. Install wall dimmers to achieve indicated rating after derating for ganging as instructed by manufacturer.
- D. Do not share neutral conductor on load side of dimmers.
- E. Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical, and grounding terminal of receptacles on top. Group adjacent switches under single, multigang wall plates.
- F. Protect devices and assemblies during painting.
- G. Adjust locations at which floor service outlets and telephone/power service poles are installed to suit arrangement of partitions and furnishings.

### **3.2 IDENTIFICATION**

- A. Comply with Division 16 Section "Electrical Identification."
- B. Comply with Division 16 Section "Basic Electrical Materials and Methods."
  - 1. Switches: Where three or more switches are ganged, and elsewhere as indicated, identify each switch with approved legend engraved on wall plate.
  - 2. Receptacles: Identify panelboard and circuit number from which served. Use machine-printed, pressure-sensitive, abrasion-resistant label tape on face of plate and durable wire markers or tags within outlet boxes.

### **3.3 CONNECTIONS**

- A. Connect wiring device grounding terminal to branch-circuit equipment grounding conductor.
- B. Isolated-Ground Receptacles: Connect to isolated-ground conductor routed to designated isolated equipment ground terminal of electrical system.
- C. Tighten electrical connectors and terminals according to manufacturers published torque-tightening values. If manufacturers torque values are not indicated, use those specified in UL 486A and UL 486B.

### **3.4 FIELD QUALITY CONTROL**

- A. Test wiring devices for proper polarity and ground continuity. Operate each device at least six times.
- B. Test GFCI operation with both local and remote fault simulations according to manufacturer's written instructions.
- C. Replace damaged or defective components.

### **3.5 CLEANING**

- A. Internally clean devices, device outlet boxes, and enclosures. Replace stained or improperly painted wall plates or devices.

**END OF SECTION**

**DIVISION 16190**  
**SUPPORTING DEVICES**

**PART 1 - GENERAL**

**1.1 RELATED REQUIREMENTS**

- A. The General Provisions, Supplemental General Provisions, Special Provisions and Division 1 Specification sections, apply to work covered by this Section.
- B. Comply with Division 16 Sections, as applicable. Refer to other Division for coordination of work.

**1.2 SCOPE OF WORK**

- A. Provide labor, material, equipment, tools and services, and perform operations required for, and reasonably incidental to, the providing of supporting devices, including related systems and accessories.

**PART 2 - PRODUCTS**

**2.1 ACCEPTABLE MANUFACTURERS**

- B. Unistrut Corp.
- C. B-Line Systems, Inc.
- D. Midland Ross-Kindorf

**2.2 MATERIALS**

A. Suspension Hangers

1.1 Suspension hangers for individual conduit runs shall be zinc plated formed steel type.

B. Vertical Supports

1.1 Malleable iron one hole pipe straps shall be used for vertical runs.

C. Clamps

1.1 Beam clamps shall be used for bar joists and beams.

D. Anti-Vibration Hangers

1.1 Anti-vibration hangers shall be combination type having a double deflection neoprene element in series with a steel coil spring; double deflection of 0.30"; steel coil spring shall be selected from a 1" static deflection series with a minimum additional travel to solid of ½"; spring

diameters shall be large enough to permit 15 degree angular misalignment of the rod connecting the hanger to the ceiling support without rubbing the hanger box.

### 2.3 Light Fixture Hangers

A. Refer to Section 16500

Corrosive Areas: PVC; at factory apply a minimum of 10-mil-thick PVC coating, bonded to metal, inside and outside.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

#### A. Hangers

1 Approved hangers and stiff leg supports shall be installed in quantity and size as required to carry the weight of raceway and contents and shall be arranged to prevent vibration transmission to the building and allow for raceway movement.

2 Hangers shall be supported by means of uncoated solid steel rods which are threaded to allow vertical adjustments. Lock nuts shall be provided in sufficient number and location to lock all rod adjustments permanently at the adjusted height. Two lock nuts shall be used unless the nut tightens against a threaded socket. Minimum rod diameters shall be as follows:

NOMINAL CONDUIT SIZE	ROD DIAMETER
1/2" through 2"	1/4"
2-1/2" through 3"	3/8"
4" and 5"	1/2"

3 Hanger spacing shall be as required for proper and adequate support raceway, but in no case shall be less than one hanger per 8'-0" of raceway length except that conduit less than 1" diameter shall be supported at least every 6'-0".

4 Where numerous conduits are run parallel to one another, they may be supported from a trapeze type hanger arrangement with strut bottom.

5 Anti-vibration type hangers shall be provided for equipment as required to minimize vibration and/or as directed by the Architect/Engineer.

#### B. Supports

1 Support of hangers shall be by means of sufficient quantities of individual

after set steel expansion shields, or beam clamps attached to structural steel.

- 2 Stiff-legs shall be furnished and installed in cases where support from overhead structure is not possible.
- 3 Ceiling mounted lighting fixtures shall be supported from the building structure at two opposite corners. The Contractor shall provide fixture hangers to properly interface with the ceiling system.
- 4 Furnish and install complete any additional structural support steel, brackets, fasteners, etc., as required to adequately support all raceway and equipment.
- 5 Support of hangers from concrete slabs shall be by means of sufficient quantity of "U" brackets attached with after set expansion shields and bolts.
- 6 Support of hangers from concrete tees shall be by means of sufficient quantity of angle iron brackets attached with after set expansion shields and bolts.

**END OF SECTION**



**DIVISION 16440**  
**DISCONNECT SWITCHES**

**PART 1 GENERAL**

**1.1 RELATED REQUIREMENTS**

- A. The General Provisions, Supplemental General Provisions, Special Provisions and Division 1 Specification sections, apply to work covered by this Section.

**1.2 SCOPE OF WORK**

- A. Provide labor, materials, equipment, tools and services, and perform operations required for, and reasonably incidental to, the providing of disconnect switches, including all related systems and accessories.

**1.3 SUBMITTALS**

- A. Submit product data and shop drawings in accordance with Division 1 for products specified under PART 2 - PRODUCTS.
- B. Provide outline drawings with dimensions, and equipment ratings for voltage, amperage, horsepower and short circuit.
- C. Provide designations for each disconnect. RE: to section 16075.

**1.4 REFERENCE STANDARDS**

- A. Switches shall be manufactured in accordance with the following standards:
  - 1. UL 98 - Enclosed and Dead Front Switches
  - 2. NEMA KS1 - Enclosed Switches
  - 3. NEMA 250 - Enclosures for Electrical Equipment

**PART 2 PRODUCTS**

**2.1 MANUFACTURER**

- A. Cutler – Hammer Products
- B. Square D Co.
- C. G.E

**2.2 GENERAL**

- A. Switches shall be heavy duty type.

### **2.3 SWITCH INTERIOR**

- A. Switches shall have switch blades which are visible when the switch is OFF and the cover is open.
- D. Lugs shall be copper and front removable and UL listed for 60°C or 75°C conductors 30-100 ampere, 75°C conductors 200 ampere and up.
- E. Current carrying parts shall be plated to resist corrosion.
- F. Switches shall have removable arc suppressor to facilitate easy access to line side lugs.
- G. Switches shall have provisions for a field installable electrical interlock.

### **2.4 SWITCH MECHANISM**

- A. Switch operating mechanism shall be quick-make, quick-break such that, during normal operation of the switch, the operation of the contacts shall not be capable of being restrained by the operating handle after the closing or opening action of the contacts has started.
- B. The operating handle shall be an integral part of the box, not the cover.
- C. Provisions for padlocking the switch in the OFF position with at least three padlocks shall be provided.
- D. The handle position shall travel at least 90° between OFF and ON positions to clearly distinguish and indicate handle position.
- E. Switches shall have a dual cover interlock mechanism to prevent unintentional opening of the switch cover when the switch is ON and prevent turning the switch ON when the cover is open. The cover interlock mechanism shall have an externally operated override but the override shall not permanently disable the interlock mechanism. The tool used to override the cover interlock mechanism shall not be required to enter the enclosure in order to override the interlock.

### **2.5 SWITCH ENCLOSURES**

- A. Switch covers shall be attached with welded pin-type hinges (Type 1) or top-hinged, attached with removable screws and securable in the open position (Type 3R).
- B. The enclosure shall be finished with gray baked enamel paint which is electrodeposited on cleaned, phosphate pre-treated steel (Type 1) or gray baked enamel paint which is electrodeposited on cleaned, phosphate pre-treated galvanized steel (Type 3R).
- C. The enclosure shall have ON and OFF markings stamped into the cover.
- D. The operating handle shall be provided with a dual colored, red/black position indication.

- E. Switches shall have provisions to accept up to three 3/8" hasp padlocks to lock the operating handle in the OFF position.
- H. Tangential knockouts shall be provided to facilitate ease of conduit entry (Type 1).
- I. Type 3R enclosure shall contain no knockouts. Supply watertight hubs.
- J. Type 4x shall be stainless steel enclosure with no knockouts. Supply watertight hubs.

## **2.6 SWITCH RATINGS**

- A. Switches shall be horsepower rated.
- B. The UL listed short circuit current rating of the switches shall be: 200,000 rms symmetrical amperes when used with or protected by Class R or Class J fuses 30-600 ampere employing appropriate fuse rejection schemes.

## **PART 3 EXECUTION**

### **3.1 INSTALLATION**

- A. Install disconnect switches where indicated shown or not shown.
- B. Install fuses in fusible disconnect switches.

**END OF SECTION**

**DIVISION 16442**  
**PANELBOARDS**

**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 load centers and panelboards, overcurrent protective devices, and associated auxiliary equipment rated 600 V and less for the following types:
  - 1. Lighting and appliance branch-circuit panelboards.
  - 2. Distribution panelboards.
  
- B. Related Sections include the following:
  - 1. Division 16 Section "Fuses."

**1.3 DEFINITIONS**

- A. EMI: Electromagnetic interference.
- B. GFCI: Ground-fault circuit interrupter.
- C. RFI: Radio-frequency interference.
- D. RMS: Root mean square.
- E. SPDT: Single pole, double throw.
- F. TVSS: Transient voltage surge suppressor.

**1.4 SUBMITTALS**

- A. Product Data: For each type of panelboard, overcurrent protective device, TVSS device, accessory, and component indicated. Include dimensions and manufacturers' technical data on features, performance, electrical characteristics, ratings, and finishes.
- B. Shop Drawings: For each panelboard and related equipment.
  - 1. Dimensioned plans, elevations, sections, and details. Show tabulations of installed devices, equipment features, and ratings. Include the following:
    - a. Enclosure types and details for types other than NEMA 250, Type 1.

- b. Bus configuration, current, and voltage ratings.
  - c. Short-circuit current rating of panelboards and overcurrent protective devices.
  - d. UL listing for series rating of installed devices.
  - e. Features, characteristics, ratings, and factory settings of individual overcurrent protective devices and auxiliary components.
2. Wiring Diagrams: Diagram power, signal, and control wiring and differentiate between manufacturer-installed and field-installed wiring.
- C. Qualification Data: Submit data for testing agencies indicating that they comply with qualifications specified in "Quality Assurance" Article.
- D. Field Test Reports: Submit written test reports and include the following:
- 1. Test procedures used.
  - 2. Test results that comply with requirements.
  - 3. Results of failed tests and corrective action taken to achieve test results that comply with requirements.
- E. Panelboard Schedules: For installation in panelboards. Submit final versions after load balancing.
- F. Maintenance Data: For panelboards and components to include in maintenance manuals specified in Division 1. In addition to requirements specified in Division 1 Section "Contract Closeout," include the following:
- 1. Manufacturer's written instructions for testing and adjusting overcurrent protective devices.
  - 2. Time-current curves, including selectable ranges for each type of overcurrent protective device.

## 1.5 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Comply with NEMA PB 1.
- C. Comply with NFPA 70.

## 1.6 COORDINATION

- A. Coordinate layout and installation of panelboards and components with other construction that penetrates walls or is supported by them, including electrical and other types of equipment, raceways, piping, and encumbrances to workspace clearance requirements.

## **1.7 EXTRA MATERIALS**

- A. Keys: [SIX] 6 spares of each type of panelboard cabinet lock.

## **PART 2 - PRODUCTS**

### **2.1 MANUFACTURERS**

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Panelboards, Overcurrent Protective Devices, Controllers, Contactors, and Accessories:
    - a. Eaton Corp.; Cutler-Hammer Products.
    - b. Square D Co.
    - c. G.E

### **2.2 FABRICATION AND FEATURES**

- A. Enclosures: Flush- and surface-mounted cabinets. NEMA PB 1, Type 1, to meet environmental conditions at installed location.
  - 1. Outdoor Locations: NEMA 250, Type 3R.
  - 2. Other Wet or Damp Indoor Locations: NEMA 250, Type 4.
  - 3. Hazardous Areas Indicated on Drawings: NEMA 250, Type 7C.
- B. Front: Secured to box with concealed trim clamps. For surface-mounted fronts, match box dimensions; for flush-mounted fronts, overlap box.
- C. Hinged Front Cover: Entire front trim hinged to box and with standard door within hinged trim cover.
- D. Finish: Manufacturer's standard enamel finish over corrosion-resistant treatment or primer coat.

- E. Directory Card: With transparent protective cover, mounted inside metal frame, inside panelboard door.
- F. Bus: Hard-drawn copper, 98 percent conductivity.
- G. Main and Neutral Lugs: Copper mechanical type suitable for use with conductor material.
- H. Equipment Ground Bus: Copper and adequate for feeder and branch-circuit equipment ground conductors; bonded to box.
- I. Service Equipment Label: UL labeled for use as service equipment for panelboards with main service disconnect switches.
- J. Isolated Equipment Ground Bus: Copper and adequate for branch-circuit equipment ground conductors; insulated from box.
- K. Extra-Capacity Neutral Bus: Copper neutral bus rated 200 percent of phase bus and UL listed as suitable for nonlinear loads.
- L. Split Bus: Vertical buses divided into individual vertical sections.
- M. Skirt for Surface-Mounted Panelboards: Same gage and finish as panelboard front with flanges for attachment to panelboard, wall, and ceiling or floor.
- N. Gutter Barrier: Arrange to isolate individual panel sections.
- O. Column-Type Panelboards: Narrow gutter extension, with cover, to overhead junction box equipped with ground and neutral terminal buses.
- P. Feed-through Lugs: Copper mechanical type suitable for use with conductor material. Locate at opposite end of bus from incoming lugs or main device.

### **2.3 PANELBOARD SHORT-CIRCUIT RATING**

- A. Fully rated to interrupt symmetrical short-circuit current available at terminals.

### **2.4 LIGHTING AND APPLIANCE BRANCH-CIRCUIT PANELBOARDS**

- A. Branch Overcurrent Protective Devices: Plug-in or bolt on circuit breakers, replaceable without disturbing adjacent units.
- B. Doors: Front mounted with concealed hinges; secured with flush latch with tumbler lock; keyed alike.

### **2.5 DISTRIBUTION PANELBOARDS**

- A. Doors: Front mounted, except omit in fused-switch panelboards; secured with vault-type latch with tumbler lock; keyed alike.
- B. Main Overcurrent Protective Devices: Circuit breaker.

- C. Branch overcurrent protective devices shall be one of the following:
  - 1. For Circuit-Breaker Frame Sizes 125 A and Smaller: Plug-in or Bolt-on circuit breakers.
  - 2. For Circuit-Breaker Frame Sizes Larger Than 125 A: Bolt-on circuit breakers; plug-in circuit breakers where individual positive-locking device requires mechanical release for removal.

## 2.6 OVERCURRENT PROTECTIVE DEVICES

- A. Molded-Case Circuit Breaker: NEMA AB 1, with interrupting capacity to meet available fault currents.
  - 1. Thermal-Magnetic Circuit Breakers: Inverse time-current element for low-level overloads, and instantaneous magnetic trip element for short circuits. Adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.
  - 2. Electronic Trip Unit Circuit Breakers: RMS sensing; field-replaceable rating plug; with the following field-adjustable settings:
    - a. Instantaneous trip.
    - b. Long- and short-time pickup levels.
    - c. Long- and short-time time adjustments.
    - d. Ground-fault pickup level, time delay, and  $I^2t$  response.
  - 3. Current-Limiting Circuit Breakers: Frame sizes 400 A and smaller; let-through ratings less than NEMA FU 1, RK-5.
  - 4. Integrally Fused Circuit Breakers: Thermal-magnetic trip element with integral limiter-style fuse listed for use with circuit breaker; trip activation on fuse opening or on opening of fuse compartment door.
  - 5. GFCI Circuit Breakers: Single- and two-pole configurations with [5] [30]-mA trip sensitivity.
- B. Molded-Case Circuit-Breaker Features and Accessories. Standard frame sizes, trip ratings, and number of poles.
  - 1. Lugs: Mechanical style, suitable for number, size, trip ratings, and material of conductors.
  - 2. Application Listing: Appropriate for application; Type SWD for switching fluorescent lighting loads; Type HACR for heating, air-conditioning, and refrigerating equipment.
  - 3. Ground-Fault Protection: Integrally mounted relay and trip unit with adjustable pickup and time-delay settings, push-to-test feature, and ground-fault indicator.



- C. Fused Switch: NEMA KS 1, Type HD; clips to accommodate specified fuses; lockable handle.

### **PART 3 - EXECUTION**

#### **3.1 INSTALLATION**

- A. Install panelboards and accessories according to NEMA PB 1.1.
- B. Mounting Heights: Top of trim 74 inches (1880 mm) above finished floor, unless otherwise indicated.
- C. Mounting: Plumb and rigid without distortion of box. Mount recessed panelboards with fronts uniformly flush with wall finish.
- D. Circuit Directory: Create a directory to indicate installed circuit loads after balancing panelboard loads. Obtain approval before installing. Use a computer or typewriter to create directory; handwritten directories are not acceptable.
- E. Install filler plates in unused spaces.
- F. Wiring in Panelboard Gutters: Arrange conductors into groups and bundle and wrap with wire ties after completing load balancing.

#### **3.2 IDENTIFICATION**

- A. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs as specified in Division 16 Section "Basic Electrical Materials and Methods" [Electrical Identification.]
- B. Panelboard Nameplates: Label each panelboard with engraved metal or laminated-plastic nameplate mounted with corrosion-resistant screws.

#### **3.3 CONNECTIONS**

- A. Install equipment grounding connections for panelboards with ground continuity to main electrical ground bus.
- B. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

#### **3.4 FIELD QUALITY CONTROL**

- A. Prepare for acceptance tests as follows:
  - 1. Test insulation resistance for each panelboard bus, component, connecting supply, feeder, and control circuit.

2. Test continuity of each circuit.
- B. Testing: After installing panelboards and after electrical circuitry has been energized, demonstrate product capability and compliance with requirements.
1. Procedures: Perform each visual and mechanical inspection and electrical test indicated in NETA ATS, Section 7.5 for switches and Section 7.6 for molded-case circuit breakers. Certify compliance with test parameters.
  2. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.
- C. Balancing Loads: After Substantial Completion, but not more than 60 days after Final Acceptance, measure load balancing and make circuit changes as follows:
1. Measure as directed during period of normal system loading.
  2. Perform load-balancing circuit changes outside normal occupancy/working schedule of the facility and at time directed. Avoid disrupting critical 24-hour services such as fax machines and on-line data-processing, computing, transmitting, and receiving equipment.
  3. After circuit changes, recheck loads during normal load period. Record all load readings before and after changes and submit test records.
  4. Tolerance: Difference exceeding 20 percent between phase loads, within a panelboard, is not acceptable. Rebalance and recheck as necessary to meet this minimum requirement.

### **3.5 ADJUSTING**

- A. Set field-adjustable switches and circuit-breaker trip ranges.

### **3.6 CLEANING**

- A. On completion of installation, inspect interior and exterior of panelboards. Remove paint splatters and other spots. Vacuum dirt and debris; do not use compressed air to assist in cleaning. Repair exposed surfaces to match original finish.

**END OF SECTION**

**DIVISION 16475**  
**FUSES**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. This Section includes the following:
  - 1. Fuses.

**1.3 SUBMITTALS**

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Product Data for each fuse type specified.
- C. Field test reports indicating and interpreting test results.
- D. Maintenance data for tripping devices to include in the operation and maintenance manual specified in Division 1.

**1.4 QUALITY ASSURANCE**

- A. Source Limitations: Obtain fuses from one source and by a single manufacturer.
- B. Comply with NFPA 70 for components and installation.
- C. Listing and Labeling: Provide fuses specified in this Section that are listed and labeled.
  - 1. The Terms "Listed" and "Labeled": As defined in the National Electrical Code, Article 100.
  - 2. Listing and Labeling Agency Qualifications: A "Nationally Recognized Testing Laboratory" (NRTL) as defined in OSHA Regulation 1910.7.

**1.5 EXTRA MATERIALS**

- A. Furnish extra materials described below that match products installed, are packaged with protective covering for storage, and are identified with labels describing contents.

1. Spare Fuses: Furnish quantity equal to 20 percent of each fuse type and size installed, but not less than 1 set of 3 of each type and size.

## **PART 2 - PRODUCTS**

### **2.1 MANUFACTURERS**

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering fuses that may be incorporated into the Work include, but are not limited to, the following:
- B. Manufacturers: Subject to compliance with requirements, provide fuses by one of the following:
  1. Cooper Industries, Inc.; Bussmann Div.
  2. Eagle Electric Mfg. Co., Inc.
  3. Ferraz Corp.
  4. General Electric Co.; Wiring Devices Div.
  5. Gould Shawmut.
  6. Tracor, Inc.; Littelfuse, Inc. Subsidiary.

### **2.2 CARTRIDGE FUSES**

- A. Characteristics: NEMA FU 1, nonrenewable cartridge fuse; class as specified or indicated; current rating as indicated; voltage rating consistent with circuit voltage.

### **2.3 SPARE FUSE CABINET**

- A. Cabinet: Wall-mounted, 0.05-inch- (1.27-mm-) thick steel unit with full-length, recessed piano-hinged door with key-coded cam lock and pull.
  1. Size: Adequate for orderly storage of spare fuses specified with 15 percent spare capacity minimum.
  2. Finish: Gray, baked enamel.
  3. Identification: Stencil legend "SPARE FUSES" in 1-1/2-inch (40-mm) letters on door.
  4. Fuse Pullers: For each size fuse.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Examine utilization equipment nameplates and installation instructions to verify proper fuse locations, sizes, and characteristics.
- B. Do not proceed with installation until unsatisfactory conditions have been corrected.

### **3.2 FUSE APPLICATIONS**

- A. Motor Branch Circuits: Class RK1, time delay.
- B. Other Branch Circuits: Class RK5, non-time delay.

### **3.3 INSTALLATION**

- A. Install fuses in fusible devices as indicated. Arrange fuses so fuse ratings are readable without removing fuse.
- B. Install spare fuse cabinet where indicated.

### **3.4 IDENTIFICATION**

- A. Install typewritten labels on inside door of each fused switch to indicate fuse replacement information.

**END OF SECTION**

**DIVISION 16511**  
**INTERIOR LIGHTING**

**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 interior lighting fixtures, lighting fixtures mounted on exterior building surfaces, emergency lighting units, and accessories.
- B. Related Sections include the following:

**1.3 SUBMITTALS**

- A. Product Data: For each type of lighting fixture indicated, arranged in order of fixture designation. Include data on features, accessories, and the following:
  - 1. Dimensions of fixtures.
  - 2. Certified results of laboratory tests for fixtures and lamps for photometric performance.
  - 3. Emergency lighting unit battery and charger.
  - 4. LED lights
  - 5. Types of lamps.
- B. Shop Drawings: Show details of nonstandard or custom fixtures. Indicate dimensions, weights, method of field assembly, components, features, and accessories.
  - 1. Wiring Diagrams: Detail wiring for fixtures and differentiate between manufacturer-installed and field-installed wiring.
- C. Coordination Drawings: Reflected ceiling plans and sections drawn to scale and coordinating fixture installation with ceiling grid, ceiling-mounted items, and other components in the vicinity. Include work of all trades that is to be installed near lighting equipment.
- D. Product Certificates: Signed by manufacturers of lighting fixtures certifying that products comply with requirements.
- E. Field Test Reports: Indicate and interpret test results for compliance with performance requirements.
- F. Maintenance Data: For lighting fixtures to include in maintenance manuals specified in Division 1.

#### **1.4 QUALITY ASSURANCE**

- A. Fixtures, Emergency Lighting Units, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by an acceptable to authorities having jurisdiction.
- B. Comply with NFPA 70.
- C. NFPA 101 Compliance: Comply with visibility and luminance requirements for exit signs.

#### **1.5 COORDINATION**

- A. Fixtures, Mounting Hardware, and Trim: Coordinate layout and installation of lighting fixtures with ceiling system and other construction.

#### **1.6 WARRANTY**

- A. General Warranty: Special warranty specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

#### **1.7 EXTRA MATERIALS**

- A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

### **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, the products indicated in the Interior Lighting Fixture Schedule at the end of Part 3.
- B. Products: Subject to compliance with requirements, provide one of the products indicated for each designation in the Interior Lighting Fixture Schedule in the plans. Submit Manufacturers as is in the Lighting Fixture Schedule or Equal. Submit Equal Manufacturers 10 days prior to bidding day for approval. For Equal Manufacturers submit lighting calculation for each equal fixture submitted for approval.

#### **2.2 FIXTURES AND FIXTURE COMPONENTS, GENERAL**

- A. Metal Parts: Free from burrs, sharp corners, and edges.
- B. Sheet Metal Components: Steel, unless otherwise indicated. Form and support to prevent warping and sagging.
- C. Doors, Frames, and Other Internal Access: Smooth operating, free from light leakage under operating conditions, and arranged to permit relamping without use of tools. Arrange doors,

frames, lenses, diffusers, and other pieces to prevent accidental falling during relamping and when secured in operating position.

- D. Reflecting Surfaces: Minimum reflectance as follows, unless otherwise indicated:
  - 1. White Surfaces: 85 percent.
  - 2. Specular Surfaces: 83 percent.
  - 3. Diffusing Specular Surfaces: 75 percent.
  - 4. Laminated Silver Metallized Film: 90 percent.
- E. Lenses, Diffusers, Covers, and Globes: 100 percent virgin acrylic plastic or annealed crystal glass, unless otherwise indicated.
  - 1. Plastic: High resistance to yellowing and other changes due to aging, exposure to heat, and ultraviolet radiation.
  - 2. Lens Thickness: 0.125 inch (3 mm) minimum, unless greater thickness is indicated.

## 2.3 LED FIXTURES

- A. Except as otherwise indicated, provide LED luminaires, of types and sizes indicated on fixture schedules.
- B. Include the following features unless otherwise indicated:
  - 1. Each Luminaire shall consist of an assembly that utilizes LEDs as the light source. In addition, a complete luminaire shall consist of a housing, LED array, and electronic driver (power supply).
  - 2. Each luminaire shall be rated for a minimum operational life of 50,000 hours utilizing a minimum ambient temperature of (25°C).
  - 3. Light Emitting Diodes tested under LM-80 Standards for a minimum of 12,000 hours.
  - 4. Color Rendering Index (CRI) of 82 at a minimum.
  - 5. Color temperature [3500] <Insert value> K, unless otherwise indicated.
  - 6. Rated lumen maintenance at 70% lumen output for 50,000 hours, unless otherwise indicated.



7. Fixture efficacy of 60 Lumens/Watt, minimum.
8. 5 year luminaire warranty, minimum.
9. Photometry must comply with IESNA LM-79.
10. The individual LEDs shall be constructed such that a catastrophic loss of the failure of one LED will not result in the loss of the entire luminaire.
11. Luminaire shall be constructed such that LED modules may be replaced or repaired without the replacement of the whole fixture.

#### C. Technical Requirements

1. Luminaire shall have a minimum efficacy of 60 lumens per watt. The luminaire shall not consume power in the off state.
2. Operation Voltage: The luminaire shall operate from a 50 HZ to 60 HZ AC line over a voltage ranging from 120 VAC to 277 VAC. The fluctuations of line voltage shall have no visible effect on the luminous output.
3. Power Factor: The luminaire shall have a power factor of 0.9 or greater.
4. THD: Total harmonic distortion (current and voltage) induced into an AC power line by a luminaire shall not exceed 15 percent.
5. Operational Performance: The LED circuitry shall prevent visible flicker to the unaided eye over the voltage range specified above.

#### D. Thermal Management

1. The thermal management (of the heat generated by the LEDs) shall be of sufficient capacity to assure proper operation of the luminaire over the expected useful life.

2. The LED manufacturer's maximum thermal pad temperature for the expected life shall not be exceeded.
3. Thermal management shall be passive by design. The use of fans or other mechanical devices shall not be allowed.
4. The luminaire shall have a minimum heat sink surface such that LED manufacturer's maximum junction temperature is not exceeded at maximum rated ambient temperature.

## **2.4 LED EXIT SIGNS**

- A. Exit light fixtures shall meet applicable requirements of NFPA and UL.
- B. Housing and door shall be die-cast aluminum.
- C. For general purpose exit light fixtures, door frame shall be hinged, with latch. For vandal-resistant exit light fixtures, door frame shall be secured with tamper-resistant screws.
- D. Finish shall be satin or fine-grain brushed aluminum.
- E. There shall be no radioactive material used in the fixtures.
- F. Fixtures:
  1. Inscription panels shall be cast or stamped aluminum a minimum of 2.25 mm (0.090 inch) thick, stenciled with 150 mm (6 inch) high letters, baked with red color stable plastic or fiberglass. Lamps shall be luminous Light Emitting Diodes (LED) mounted in center of letters on red color stable plastic or fiberglass.
  2. Double-Faced Fixtures: Provide double-faced fixtures where required or as shown on drawings.
  3. Directional Arrows: Provide directional arrows as part of the inscription panel where required or as shown on drawings. Directional arrows shall be the "chevron-type" of similar size and width as the letters and meet the requirements of NFPA 101.
- G. Voltage: Multi-voltage (120 – 277V).

## **2.5 EMERGENCY LIGHTING UNITS**

- A. General Requirements: Self-contained units. Comply with UL 924. Units include the following features:
  1. Battery: Sealed, maintenance-free, lead-acid type with minimum 5-year nominal life and special warranty.

2. Charger: Fully automatic, solid-state type with sealed transfer relay.
3. Operation: Relay automatically turns lamp on when supply circuit voltage drops to 80 percent of nominal voltage or below. Lamp automatically disconnects from battery when voltage approaches deep-discharge level. When normal voltage is restored, relay disconnects lamps, and battery is automatically recharged and floated on charger.

## **2.6 LAMPS**

- A. ALL LED – NO LAMPS

## **2.7 FINISHES**

- A. Fixtures: Manufacturer's standard, unless otherwise indicated.

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION**

- A. Fixtures: Set level, plumb, and square with ceiling and walls, and secure according to manufacturer's written instructions and approved submittal materials. Install lamps in each fixture.
- B. Support for Fixtures in or on Grid-Type Suspended Ceilings: Do not use grid for support.
  1. Install a minimum of two ceiling support system wires for each fixture. Locate not more than 6 inches (150 mm) from fixture corners.
  2. Support Clips: Fasten to fixtures and to ceiling grid members at or near each fixture corner.
  3. Fixtures of Sizes Less Than Ceiling Grid: Arrange as indicated on reflected ceiling plans or center in acoustical panel, and support fixtures independently with at least two 3/4-inch (20-mm) metal channels spanning and secured to ceiling tees.
- C. Suspended Fixture Support: As follows:
  1. Pendants and Rods: Where longer than 48 inches (1200 mm), brace to limit swinging.
  2. Stem-Mounted, Single-Unit Fixtures: Suspend with twin-stem hangers.

### **3.2 CONNECTIONS**

- A. Ground equipment.
  1. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

### **3.3 FIELD QUALITY CONTROL**

- A. Inspect each installed fixture for damage. Replace damaged fixtures and components.
- B. Advance Notice: Give dates and times for field tests.

- C. Provide instruments to make and record test results.
- D. Tests: As follows:
  - 1. Verify normal operation of each fixture after installation.
  - 2. Emergency Lighting: Interrupt electrical supply to demonstrate proper operation.
  - 3. Verify normal transfer to battery source and retransfer to normal.
  - 4. Report results in writing.
- E. Malfunctioning Fixtures and Components: Replace or repair, then retest. Repeat procedure until units operate properly.
- F. Corrosive Fixtures: Replace during warranty period.

#### **3.4 CLEANING AND ADJUSTING**

- A. Clean fixtures internally and externally after installation. Use methods and materials recommended by manufacturer.
- B. Adjust aimable fixtures to provide required light intensities.

**END OF SECTION**

**DIVISION 16521**  
**EXTERIOR LIGHTING**

**PART 1 - GENERAL**

**1.1 DESCRIPTION**

This section specifies the furnishing, installation, and connection of exterior fixtures, poles, and supports. The terms "lighting fixtures", "fixture" and "luminaire" are used interchangeably.

**1.2 RELATED WORK**

- A. Section CAST-IN-PLACE CONCRETE.
- B. Section SCHEDULE FOR FINISHES: Finishes for exterior light poles and luminaires.
- C. Section REQUIREMENTS FOR ELECTRICAL INSTALLATIONS: General electrical requirements and items that are common to more than one section of Division 26.
- D. Section LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES (600 VOLTS AND BELOW): Low voltage power and lighting wiring.
- E. Section GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS: Requirements for personnel safety and to provide a low impedance path for possible ground fault currents.
- F. Section RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS: Conduits, fittings, and boxes for raceway systems.
- G. Section UNDERGROUND ELECTRICAL CONSTRUCTION: Underground handholes and conduits.
- H. Section LIGHTING CONTROLS: Controls for exterior lighting.

**1.3 QUALITY ASSURANCE**

- A. Refer to Paragraph, QUALIFICATIONS (PRODUCTS AND SERVICES), in Section 26 05 11, REQUIREMENTS FOR ELECTRICAL INSTALLATIONS.

**1.4 SUBMITTALS**

- A. Submit six copies of the following in accordance with Section REQUIREMENTS FOR ELECTRICAL INSTALLATIONS.
  - 1. Shop Drawings:
    - a. Submit the following information for each type of lighting fixture designated on the LIGHTING FIXTURE SCHEDULE, arranged in order of lighting fixture designation.
    - b. Material and construction details, include information on housing and optics system.
    - c. Physical dimensions and description.
    - d. Wiring schematic and connection diagram.

- e. Installation details.
  - f. Energy efficiency data.
  - g. Photometric data based on laboratory tests complying with IES Lighting Measurements testing and calculation guides.
  - h. For LED lighting fixtures, submit US DOE LED Lighting Facts label, and IES L70 rated life.
  - i. Submit site plan showing all exterior lighting fixtures with fixture tags consistent with Lighting Fixture Schedule as shown on drawings. Site plan shall show computer generated point-by-point illumination calculations. Include lamp lumen and light loss factors used in calculations.
2. Manuals:
- a. Submit, simultaneously with the shop drawings, complete maintenance and operating manuals, including technical data sheets, wiring diagrams, and information for ordering replacement parts.
  - b. If changes have been made to the maintenance and operating manuals originally submitted, submit updated maintenance and operating manuals two weeks prior to the final inspection.
3. Certifications: Two weeks prior to final inspection, submit the following.
- a. Certification by the Contractor that the exterior lighting systems have been properly installed and tested.

**1.5 APPLICABLE PUBLICATIONS**

- A. Publications listed below (including amendments, addenda, revisions, supplements, and errata) form a part of this specification to the extent referenced. Publications are referenced in the text by designation only.
- B. Aluminum Association Inc. (AA):  
AAH35.1-06.....Alloy and Temper Designation Systems for Aluminum
- C. American Association of State Highway and Transportation Officials (AASHTO):  
32-LTS-6 ..... Structural Supports for Highway Signs, Luminaires and Traffic Signals
- D. American Concrete Institute (ACI):  
318-05 ..... Building Code Requirements for Structural Concrete
- E. American National Standards Institute (ANSI):  
C81.61-09 ..... Electrical Lamp Bases – Specifications for Bases (Caps) for Electric Lamps

- F. American Society for Testing and Materials (ASTM):
  - A123/A123M-12 .....Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
  - A153/A153M-09 .....Zinc Coating (Hot-Dip) on Iron and Steel Hardware
  - B108-03a-08 .....Aluminum-Alloy Permanent Mold Castings
  - C1089-13 .....Spun Cast Prestressed Concrete Poles
- G. Federal Aviation Administration (FAA):
  - AC 70/7460-IK-07.....Obstruction Lighting and Marking
  - AC 150/5345-43F-06.....Obstruction Lighting Equipment
- H. Illuminating Engineering Society of North America (IESNA):
  - HB-9-00 .....Lighting Handbook
  - RP-8-05 .....Roadway Lighting
  - LM-52-03 .....Photometric Measurements of Roadway Sign Installations
  - LM-72-10 .....Directional Positioning of Photometric Data
  - LM-79-08 .....Approved Method for the Electrical and Photometric Measurements  
of Solid-State Lighting Products
  - LM-80-08 .....Approved Method for Measuring Lumen Maintenance of LED Light  
Sources
  - TM-15-07 .....Backlight, Uplight and Glare (BUG) Ratings
- I. National Electrical Manufacturers Association (NEMA):
  - C78.41-06 .....Electric Lamps – Guidelines for Low-Pressure Sodium Lamps
  - C78.42-07 .....Electric Lamps – Guidelines for High-Pressure Sodium Lamps
  - C78.43-07 .....Electric Lamps – Single-Ended Metal-Halide Lamps
  - C78.1381-98 .....Electric Lamps – 70-Watt M85 Double-Ended Metal-Halide Lamps
  - C82.4-02 .....Ballasts for High-Intensity-Discharge and Low-Pressure Sodium  
Lamps (Multiple-Supply Type)
  - C136.3-05 .....For Roadway and Area Lighting Equipment – Luminaire  
Attachments
  - C136.17-05 .....Roadway and Area Lighting Equipment – Enclosed Side-Mounted  
Luminaires for Horizontal-Burning High-Intensity-Discharge Lamps  
– Mechanical Interchangeability of Refractors
  - ICS 2-00 (R2005) .....Controllers, Contactors and Overload Relays Rated 600 Volts
  - ICS 6-93 (R2006) .....Enclosures
- J. National Fire Protection Association (NFPA):
  - 70-11 .....National Electrical Code (NEC)

K. Underwriters Laboratories, Inc. (UL):

- 496-08 ..... Lampholders
- 773-95 ..... Plug-In, Locking Type Photocontrols for Use with Area Lighting
- 773A-06 ..... Nonindustrial Photoelectric Switches for Lighting Control
- 1029-94 ..... High-Intensity-Discharge Lamp Ballasts
- 1598-08 ..... Luminaires
- 8750-09.....Light Emitting Diode (LED) Equipment for Use in Lighting Products

**1.6 DELIVERY, STORAGE, AND HANDLING**

Provide manufacturer’s standard provisions for protecting pole finishes during transport, storage, and installation. Do not store poles on ground. Store poles so they are at least 305 mm (12 inches) above ground level and growing vegetation. Do not remove factory-applied pole wrappings until just before installing pole.

**PART 2 - PRODUCTS**

**2.1 GENERAL REQUIREMENTS**

Luminaires, materials and equipment shall be in accordance with NEC, UL, ANSI, and as shown on the drawings and specified.

**2.2 POLES**

A. General:

1. Poles shall be as shown on the drawings, and as specified. Finish shall be as specified on the drawings.
2. The pole and arm assembly shall be designed for wind loading of 110 mph) minimum, as required by wind loading conditions at project site, with an additional 30% gust factor and supporting luminaire(s) and accessories such as shields, banner arms, and banners that have the effective projected areas indicated. The effective projected area of the pole shall be applied at the height of the pole base, as shown on the drawings.
3. Poles shall be //embedded// //anchor-bolt// type designed for use with underground supply conductors. Poles shall have handhole having a minimum clear opening of 65 x 125 mm (2.5 x 5 inches). Handhole covers shall be secured by stainless steel captive screws.
4. Provide a steel-grounding stud opposite handhole openings, designed to prevent electrolysis when used with copper wire.



5. Provide a base cover that matches the pole in material and color to conceal the mounting hardware pole-base welds and anchor bolts.
6. Hardware and Accessories: All necessary hardware and specified accessories shall be the product of the pole manufacturer.
7. Provide manufacturer's standard finish, as scheduled on the drawings. Where indicated on drawings, provide finishes as indicated in Section 09 06 00, SCHEDULE FOR FINISHES.

B. Types:

1. Pole – refer to light fixture schedule.

### **2.3 FOUNDATIONS FOR POLES**

- A. Foundations shall be cast-in-place concrete, having 3000 psi minimum 28-day compressive strength.
- B. Foundations shall support the effective projected area of the specified pole, arm(s), luminaire(s), and accessories, such as shields, banner arms, and banners, under wind conditions previously specified in this section.
- C. Place concrete in spirally-wrapped treated paper forms for round foundations, and construct forms for square foundations.
- D. Rub-finish and round all above-grade concrete edges to approximately 6 mm (0.25-inch) radius.
- E. Anchor bolt assemblies and reinforcing of concrete foundations shall be as shown on the drawings. Anchor bolts shall be in a welded cage or properly positioned by the tie wire to stirrups.
- F. Prior to concrete pour, install electrode per Section 26 05 26, GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS.

### **2.4 LUMINAIRES**

- A. Luminaires shall be weatherproof, heavy duty, outdoor types designed for efficient light utilization, adequate dissipation of lamp and ballast heat, and safe cleaning and relamping.
- B. Illumination distribution patterns, BUG ratings and cutoff types as defined by the IESNA shall be as shown on the drawings.
- C. Incorporate ballasts in the luminaire housing, except where otherwise shown on the drawings.
- D. Lenses shall be frame-mounted, heat-resistant, borosilicate glass, with prismatic refractors, unless otherwise shown on the drawings. Attach the frame to the luminaire housing by hinges or

chain. Use heat and aging-resistant, resilient gaskets to seal and cushion lenses and refractors in luminaire doors.

- E. Lamp sockets for high intensity discharge (H.I.D) fixture shall have locking-type porcelain enclosures in conformance to the applicable requirements of ANSI C81.61-09 and UL 496-08.
- F. Pre-wire internal components to terminal strips at the factory.
- G. Bracket-mounted luminaires shall have leveling provisions and clamp-type adjustable slip-fitters with locking screws.
- H. Materials shall be rustproof. Latches and fittings shall be non-ferrous metal.
- I. Provide manufacturer's standard finish, as scheduled on the drawings. Where indicated on drawings, match finish process and color of pole or support materials. Where indicated on drawings, provide finishes as indicated in Section 09 06 00, SCHEDULE FOR FINISHES.
- J. Luminaires shall carry factory labels, showing complete, specific lamp and ballast information.

## **2.5 LAMPS**

- F. LED sources shall meet the following requirements:
  - 1. Operating temperature rating shall be between -40 degrees C (-40 degrees F) and 50 degrees C (120 degrees F).
  - 2. Correlated Color Temperature (CCT)://4000K//.
  - 3. Color Rendering Index (CRI):  $\geq 85$ .
  - 4. The manufacturer shall have performed reliability tests on the LEDs luminaires complying with Illuminating Engineering Society (IES) LM79 for photometric performance and LM80 for lumen maintenance and L70 life.//
- G. Mercury vapor lamps shall not be used.

## **2.6 LED DRIVERS**

- A. LED drivers shall meet the following requirements:
  - 1. Drivers shall have a minimum efficiency of 85%.
  - 2. Starting Temperature: -40 degrees C (-40 degrees F).
  - 3. Input Voltage: 120 to 480 ( $\pm 10\%$ ) volt.
  - 4. Power Supplies: Class I or II output.
  - 5. Surge Protection: The system must survive 250 repetitive strikes of "C Low" (C Low: 6kV/1.2 x 50  $\mu$ s, 10kA/8 x 20  $\mu$ s) waveforms at 1-minute intervals with less than 10% degradation in

clamping voltage. "C Low" waveforms are as defined in IEEE/ASNI C62.41.2-2002, Scenario 1 Location Category C.

6. Power Factor (PF):  $\geq 0.90$ .
7. Total Harmonic Distortion (THD):  $\leq 20\%$ .
8. Comply with FCC Title 47 CFR Part 18 Non-consumer RFI/EMI Standards.
9. Drivers shall be reduction of hazardous substances (ROHS)-compliant.//

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION**

- A. Install lighting in accordance with the NEC, as shown on the drawings, and in accordance with manufacturer's recommendations.
- B. Pole Foundations:
  1. Excavate only as necessary to provide sufficient working clearance for installation of forms and proper use of tamper to the full depth of the excavation. Prevent surface water from flowing into the excavation. Thoroughly compact backfill with compacting arranged to prevent pressure between conductor, jacket, or sheath, and the end of conduit.
  2. Set anchor bolts according to anchor-bolt templates furnished by the pole manufacturer.
  3. Install poles as necessary to provide a permanent vertical position with the bracket arm in proper position for luminaire location.
  4. After the poles have been installed, shimmed, and plumbed, grout the spaces between the pole bases and the concrete base with non-shrink concrete grout material. Provide a plastic or copper tube, of not less than 9 mm (0.375-inch) inside diameter through the grout, tight to the top of the concrete base to prevent moisture weeping from the interior of the pole.
- C. Install lamps in each luminaire.
- D. Adjust luminaires that require field adjustment or aiming.

### **3.2 GROUNDING**

Ground noncurrent-carrying parts of equipment, including metal poles, luminaires, mounting arms, brackets, and metallic enclosures, as specified in Section 26 05 26, GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS. Where copper grounding conductor is connected to a metal other than copper, provide specially-treated or lined connectors suitable and listed for this purpose.

### **3.3 ACCEPTANCE CHECKS AND TESTS**

Verify operation after installing luminaires and energizing circuits.

**END OF SECTION**

**DIVISION 16900**  
**EQUIPMENT CONNECTIONS AND CONTROL WIRING**

**PART 1 - GENERAL**

**1.1 RELATED REQUIREMENTS**

- A. The General Provisions, Supplemental General Provisions, Special Provisions and Division 1 Specification sections, apply to work covered by this Section.
- B. Comply with Division 16 Sections, as applicable. Refer to other Divisions for coordination of work.
- C. The furnishing and installation of control power wiring required for equipment furnished under Division 15 and not shown on the electrical drawings shall be furnished under Division 15. Control power wiring is defined as the line voltage (120V) power wiring for equipment control cabinets, temperature control, energy management, or building automation system panels and line voltage smoke/fire dampers. Provide 120V to equipment control devices. Coordinate with Division 15 prior to rough-ins.
- D. The furnishing and installation of the temperature control wiring, energy management system or building automation wiring not shown on the electrical drawings shall be furnished under Division 15. Temperature control, energy management system and building automation system wiring is defined as the interlock or interconnecting wiring required between system control devices, appurtenances and control panels to allow the system to function automatically. This includes wiring between the fire alarm system, smoke exhaust systems, door entry systems and any other system requiring interface with the temperature control, energy management and building automation system.

**1.2 SCOPE OF WORK**

- A. Provide labor, materials, equipment, tools and services, and perform operations required for, and reasonably incidental to, the providing of power wiring to each motor-driven and/or electrically-operated system or unit of equipment.
- B. Provide labor, materials, equipment, tools and services, and perform operations required for, and reasonably incidental to, the providing of the line voltage wiring serving power to a motor(s) or piece of electric powered equipment. The wiring shall allow the motor(s) or equipment to operate in a manual mode.
- C. All control wiring above the ceiling or in the A/C return plenum shall be plenum rated cable.
- D. Provide labor, materials, equipment, tools and services and perform operations required for, and reasonably incidental to, the providing of control wiring for miscellaneous systems. The Contractor shall be responsible for reviewing the project specifications to ascertain the extent of the control wiring required for the miscellaneous systems and shall assume the responsibility for performing the work.
- E. Provide labor, materials, equipment, tools and services, and perform operations required for and reasonably incidental to, the providing of a fully connected and operating smoke damper installation. Coordinate with the mechanical contractor th required work. The following is a description of the responsibilities for the specified system:
  - 1 The mechanical contractor will provide the smoke dampers and actuators as indicated

in the specifications and on the plans. In addition, if the smoke dampers have pneumatic actuators, the mechanical contractor will provide all control air piping from a source to each smoke damper and the electro-pneumatic (EP) and/or pneumatic-electric (PE) switches as required for actuation of the smoke dampers.

- 2 The electrical contractor shall provide the power wiring for the smoke damper actuators.
- 3 The fire alarm contractor shall provide the signal and control wiring for the operation of the smoke dampers including all wiring of EP and/or PE switches.

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

- A. Materials and equipment provided hereinafter shall comply with other Division 16 Sections and with Division 15 of these Specifications.

## **PART 3 - EXECUTION**

### **3.1 MOTORS**

- A. Except for items that are furnished with factory-installed, integral motors, an electric motor of required size and electrical characteristics will be provided and installed as specified in Division 15 for each item of motor-driven equipment. As part of the work of this Section, complete the electrical installation of these motors in accordance with approved wiring diagrams and instructions.
- B. Where disconnect switches or circuit breakers are not provided integral with control equipment for motors and other electrical appurtenances, provide and install all disconnect switches required by the National Electrical Code and/or as indicated on the Drawings.

### **3.2 SYSTEM, EQUIPMENT AND DEVICE WIRING**

- A. Connect complete for operation all items of heating, ventilation, air conditioning, plumbing, fire protection and all electrical systems, equipment and devices furnished by the Owner or specified in other Divisions of the Specifications. System, equipment and device outlets of various types have been indicated in the Specifications or on the drawings, but indication of exact location or scope of the work may not be indicated. Refer to the Owner and to the work specified in the other Divisions for the scope of connections to the equipment furnished by them and for the exact locations of all connections to the equipment furnished by them. Power wiring shall be provided under Division 16 as indicated. Control wiring not indicated to be provided under Division 16 shall be provided by the provider of the system, equipment, or device and installed and terminated under Division 16. Request all rough-in drawings required for proper installation of the electrical work in ample time to permit preparation of the installation drawings and thus avoid delays on the job.

**END OF SECTION**

**EXHIBIT "B"**

**BID PAGE**

**Hidalgo County – Urban County Program  
City of Hidalgo – 2016 Parks, Recreational Facility Improvements (Valle Alto Park)  
Bid No.: 5016/17-35-0306-5000-3500-UCP-GVG**

**SCOPE OF WORK DESCRIPTION:  
City of Hidalgo – 2016 Parks, Recreational Facility Improvements (Valle Alto Park)  
New concession stand, lighting and walking trail improvements**

**BID PRICE:** \$ \_\_\_\_\_

**ALTERNATE PRICE:** \$ \_\_\_\_\_

**BIDDER/COMPANY NAME:** \_\_\_\_\_

**ADDRESS:** \_\_\_\_\_

**CITY/STATE/ZIP CODE:** \_\_\_\_\_

**PHONE & FAX NO.'S:** \_\_\_\_\_

**CELLULAR #:** \_\_\_\_\_

**AUTHORIZED SIGNATURE:** \_\_\_\_\_

**PRINTED NAME:** \_\_\_\_\_

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

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

**BID FOR UNIT PRICE CONTRACTS**

PLACE Hidalgo County Purchasing Dept.

DATE October 10, 2018

PROJECT NO. 5016/17-35-0306-5000-3500-UCP-GVG

Proposal of \_\_\_\_\_ (hereinafter called "Bidder")  
\*a corporation/ a partnership, or an individual doing business as: \_\_\_\_\_.

To the Hidalgo County (hereinafter called "Owner")

Gentlemen:

The Bidder, in compliance with your invitation for bids for the construction of **City of Hidalgo – 2016 Parks, Recreational Facility Improvements (Valle Alto Park)** having examined the plans and specifications with related documents and the site of the proposed work, and being familiar with all of the conditions surrounding the construction of the proposed project including the availability of materials and labor, hereby proposes to furnish all labor, materials, and supplies; and to construct the project in accordance with the Contract Documents, within the time set forth therein, and at the prices stated below. These prices are to cover all expenses incurred in performing the work required under the Contract Documents, of which this proposal is part.

Bidder hereby agrees to commence work under this contract on or about date to be specified in written "Notice to Proceed" of the owner and to fully complete the project within **120** consecutive calendar days thereafter as stipulated in the specifications. Bidder further agrees to pay as liquidated damages the sum of **\$500.00** for each consecutive calendar day thereafter as herein after provided in Paragraph 19 of the General Conditions.

**BIDDER ACKNOWLEDGES RECEIPT OF THE FOLLOWING ADDENDUM:**

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\*Insert corporation, partnership or individual as applicable.



Bidder agrees to perform all of the **City of Hidalgo – 2016 Parks, Recreational Facility Improvements (Valle Alto Park)** work described in the specifications and shown on plans, for the following unit prices:

**A. City of Hidalgo Valle Alto Park Improvements**

<u>Item No.</u>	<u>Est. Qty.</u>	<u>Description</u>	<u>Unit Price (Each)</u>	<u>Total</u>
1.	Lump Sum	Demolition	_____ Dollars & Cents (\$ _____ )	_____ Dollars & Cents (\$ _____ )
2.	Lump Sum	New Concession Stand Including All Architectural, Electrical and Structural Improvements As Shown on Plans	_____ Dollars & Cents (\$ _____ )	_____ Dollars & Cents (\$ _____ )
3.	Lump Sum	Lighting on Soccer Field As Per MEP Plans	_____ Dollars & Cents (\$ _____ )	_____ Dollars & Cents (\$ _____ )

**TOTAL BASE BID (ITEM A) : \$ \_\_\_\_\_**

**A-1. Add Alternate No. 1 (Walking Trail Improvements)**

1.	2,600 SY	Subgrade Prep.	_____ Dollars & Cents (\$ _____ )	_____ Dollars & Cents (\$ _____ )
2.	2,600 SY	6" Flex Base	_____ Dollars & Cents (\$ _____ )	_____ Dollars & Cents (\$ _____ )
3.	6,100 SY	1 ¼" HMA (Type "D")	_____ Dollars & Cents (\$ _____ )	_____ Dollars & Cents (\$ _____ )

**TOTAL ADD ALTERNATE NO. 1: \$ \_\_\_\_\_**

**(AMOUNTS ARE TO BE SHOWN IN BOTH WORDS AND FIGURES. IN CASE OF DISCREPANCY, THE AMOUNT SHOWN IN WORDS WILL GOVERN)**

The above unit price shall include all labor, materials, bailing, shoring, removal, overhead, profit, insurance, etc., to cover the finished work of the several kinds called for.

Bidder understands that the Owner reserves the right to reject any or all bids and to waive any informalities in the bidding.

The Bidder agrees that this bid shall be good and may not be withdrawn for a period of 30 calendar days after the scheduled closing time for receiving bids.

Upon receipt of written notice of the acceptance of this bid, Bidder will execute the formal contract attached within 10 days and deliver a Surety Bond, or Bonds as required by Paragraph 29 of the General Conditions. The bid security attached in the sum of \$ \_\_\_\_\_.

(\$ \_\_\_\_\_) is to become the property of the Owner in the event that contract and the bond are not executed within the time above set forth, as liquidated damages for the delay and additional expenses to the owner caused thereby.

Respectfully submitted:

By: \_\_\_\_\_  
(Title)

\_\_\_\_\_  
(Business Address and Zip Code)

(SEAL – if bid is by a corporation)

## **EXHIBIT "C"**

### **Insurance Requirements**

The Bidder awarded the contract shall furnish proof of insurance, which will also include any subcontractor that is subcontracted by the bidder in at least the following limits, to be in place prior to providing any services under this Contract and to continue at all times in force in effect during the term of this Contract:

1. A One Million Dollar (\$1,000,000.00) Comprehensive General Liability insurance policy providing additional coverage to all underlying liabilities of County.
2. Automobile liability insurance policy with limits of at least Two Hundred Thousand Dollars (\$250,000.00) per person and Five Hundred Thousand Dollars (\$500,000.00) per occurrence. Coverage should include injury to or death of persons and property damage claims with limits up to Five Hundred Thousand (\$500,000.00) arising out of the services provided to County hereunder.
3. Uninsured/Underinsured motorist coverage in an amount equal to the bodily injury limits set forth immediately above;
4. Workers compensation insurance in amounts established by Texas law, unless the Bidder is specifically exempted from the Texas Workers Compensation Act, Texas Labor Code Chapter 401, et. seq.

Certificates of insurance naming County as an additional insured shall be submitted to County for approval prior to any services being performed by Contractor. Each policy of insurance required hereunder shall extend for a period equivalent to, or longer than the term of the Contract, and any insurer hereunder shall be required to give at least thirty (30) days written notice to the County prior to the cancellation of any such coverage on the termination date, or otherwise. This Contract shall be automatically suspended upon the cancellation, or other termination, of any required policy of insurance hereunder, and such suspension shall continue until evidence adequate replacement coverage is provided to County. If replacement coverage is not provided within thirty (30) days following suspension of the Contract, this Contract shall automatically terminate.

## Insurance Requirement Acknowledgment

I, \_\_\_\_\_, authorized representative for \_\_\_\_\_,  
Company/Vendor

hereby acknowledge receipt of the County's required insurance limits. Said requirements:

- will be acquired within 10 working days after notification from the Urban County Program Coordinator of bid awarded by the Hidalgo County Commissioners' Court;
- will acquire additional amounts required to meet the County's requirements within 10 working days after notification from the Urban County Program Coordinator of bid award by the Hidalgo County Commissioners' Court; currently carry the following:

Automobile Liability: \$ \_\_\_\_\_ General Liability: \$ \_\_\_\_\_

- have already been met, see attached copy of insurance certificate.

\_\_\_\_\_  
Authorized Representative

\_\_\_\_\_  
Date

### **Notice to Bidder:**

A certificate of insurance for the required insurance limits shall be provided to the Urban County Program Coordinator in order to qualify for award of bid and to execute a contract between your Company and the County.

Failure to provide Certificates of Insurance to the Urban County Program Coordinator will cause the bid award to be rescinded and re-awarded to next lowest bidder. Certificates of Insurance will be monitored and verified on a **quarterly basis** to ensure coverage policy is in place. It is the Company's obligation to maintain the appropriate insurance coverage throughout the term of the contract.

**THIS FORM MUST ACCOMPANY BID PACKET**

# PROJECT REQUIREMENTS ACKNOWLEDGMENT

This is to certify that I, \_\_\_\_\_, possess all of the APPLICABLE:

1. Licenses: \_\_\_\_\_
2. Bonds: \_\_\_\_\_
3. Certificates: \_\_\_\_\_
4. Permits: \_\_\_\_\_
5. Other: \_\_\_\_\_

necessary to carry out the required project. Furthermore, I am providing copies of the required documentation so that, if my company is awarded this bid, I may be eligible to enter into a contract with Hidalgo County and proceed to complete the project in a timely manner.

\* Any licenses, bonds, certificates, permits, etc. which are required must be presented as part of the bid packet in order to expedite the bid evaluation process. Failure to provide said documentation will result in the disqualification of your bid.

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

\_\_\_\_\_  
Date

\_\_\_\_\_  
Company

\_\_\_\_\_  
Address

\_\_\_\_\_  
City, State, Zip

**EXHIBIT D-1**

# CONFLICT OF INTEREST QUESTIONNAIRE

# FORM CIQ

## For vendor doing business with local governmental entity

This questionnaire reflects changes made to the law by H.B. 23, 84th Leg., Regular Session.

This questionnaire is being filed in accordance with Chapter 176, Local Government Code, by a vendor who has a business relationship as defined by Section 176.001(1-a) with a local governmental entity and the vendor meets requirements under Section 176.006(a).

By law this questionnaire must be filed with the records administrator of the local governmental entity not later than the 7th business day after the date the vendor becomes aware of facts that require the statement to be filed. See Section 176.006(a-1), Local Government Code.

A vendor commits an offense if the vendor knowingly violates Section 176.006, Local Government Code. An offense under this section is a misdemeanor.

### OFFICE USE ONLY

Date Received

**1 Name of vendor who has a business relationship with local governmental entity.**

**2**  Check this box if you are filing an update to a previously filed questionnaire. (The law requires that you file an updated completed questionnaire with the appropriate filing authority not later than the 7th business day after the date on which you became aware that the originally filed questionnaire was incomplete or inaccurate.)

**3 Name of local government officer about whom the information is being disclosed.**

\_\_\_\_\_  
Name of Officer

**4 Describe each employment or other business relationship with the local government officer, or a family member of the officer, as described by Section 176.003(a)(2)(A). Also describe any family relationship with the local government officer. Complete subparts A and B for each employment or business relationship described. Attach additional pages to this Form CIQ as necessary.**

A. Is the local government officer or a family member of the officer receiving or likely to receive taxable income, other than investment income, from the vendor?

Yes  No

B. Is the vendor receiving or likely to receive taxable income, other than investment income, from or at the direction of the local government officer or a family member of the officer AND the taxable income is not received from the local governmental entity?

Yes  No

**5 Describe each employment or business relationship that the vendor named in Section 1 maintains with a corporation or other business entity with respect to which the local government officer serves as an officer or director, or holds an ownership interest of one percent or more.**

**6**  Check this box if the vendor has given the local government officer or a family member of the officer one or more gifts as described in Section 176.003(a)(2)(B), excluding gifts described in Section 176.003(a-1).

**7**

\_\_\_\_\_  
Signature of vendor doing business with the governmental entity

\_\_\_\_\_  
Date

## **CONFLICT OF INTEREST QUESTIONNAIRE**

### **For vendor doing business with local governmental entity**

A complete copy of Chapter 176 of the Local Government Code may be found at <http://www.statutes.legis.state.tx.us/Docs/LG/htm/LG.176.htm>. For easy reference, below are some of the sections cited on this form.

**Local Government Code § 176.001(1-a)**: "Business relationship" means a connection between two or more parties based on commercial activity of one of the parties. The term does not include a connection based on:

- (A) a transaction that is subject to rate or fee regulation by a federal, state, or local governmental entity or an agency of a federal, state, or local governmental entity;
- (B) a transaction conducted at a price and subject to terms available to the public; or
- (C) a purchase or lease of goods or services from a person that is chartered by a state or federal agency and that is subject to regular examination by, and reporting to, that agency.

**Local Government Code § 176.003(a)(2)(A) and (B)**:

(a) A local government officer shall file a conflicts disclosure statement with respect to a vendor if:

\*\*\*

(2) the vendor:

(A) has an employment or other business relationship with the local government officer or a family member of the officer that results in the officer or family member receiving taxable income, other than investment income, that exceeds \$2,500 during the 12-month period preceding the date that the officer becomes aware that

- (i) a contract between the local governmental entity and vendor has been executed; or
- (ii) the local governmental entity is considering entering into a contract with the vendor;

(B) has given to the local government officer or a family member of the officer one or more gifts that have an aggregate value of more than \$100 in the 12-month period preceding the date the officer becomes aware that:

- (i) a contract between the local governmental entity and vendor has been executed; or
- (ii) the local governmental entity is considering entering into a contract with the vendor.

**Local Government Code § 176.006(a) and (a-1)**

(a) A vendor shall file a completed conflict of interest questionnaire if the vendor has a business relationship with a local governmental entity and:

- (1) has an employment or other business relationship with a local government officer of that local governmental entity, or a family member of the officer, described by Section 176.003(a)(2)(A);
- (2) has given a local government officer of that local governmental entity, or a family member of the officer, one or more gifts with the aggregate value specified by Section 176.003(a)(2)(B), excluding any gift described by Section 176.003(a-1); or
- (3) has a family relationship with a local government officer of that local governmental entity.

(a-1) The completed conflict of interest questionnaire must be filed with the appropriate records administrator not later than the seventh business day after the later of:

(1) the date that the vendor:

- (A) begins discussions or negotiations to enter into a contract with the local governmental entity; or
- (B) submits to the local governmental entity an application, response to a request for proposals or bids, correspondence, or another writing related to a potential contract with the local governmental entity; or

(2) the date the vendor becomes aware:

- (A) of an employment or other business relationship with a local government officer, or a family member of the officer, described by Subsection (a);
- (B) that the vendor has given one or more gifts described by Subsection (a); or
- (C) of a family relationship with a local government officer.



**EXHIBIT D-2**

# LOCAL GOVERNMENT OFFICER CONFLICTS DISCLOSURE STATEMENT

## FORM CIS

(Instructions for completing and filing this form are provided on the next page.)

This questionnaire reflects changes made to the law by H.B. 23, 84th Leg., Regular Session.

This is the notice to the appropriate local governmental entity that the following local government officer has become aware of facts that require the officer to file this statement in accordance with Chapter 176, Local Government Code.

### OFFICE USE ONLY

Date Received

1 Name of Local Government Officer

2 Office Held

3 Name of vendor described by Sections 176.001(7) and 176.003(a), Local Government Code

4 Description of the nature and extent of each employment or other business relationship and each family relationship with vendor named in item 3.

5 List gifts accepted by the local government officer and any family member, if aggregate value of the gifts accepted from vendor named in item 3 exceeds \$100 during the 12-month period described by Section 176.003(a)(2)(B).

Date Gift Accepted \_\_\_\_\_ Description of Gift \_\_\_\_\_

Date Gift Accepted \_\_\_\_\_ Description of Gift \_\_\_\_\_

Date Gift Accepted \_\_\_\_\_ Description of Gift \_\_\_\_\_

(attach additional forms as necessary)

6 AFFIDAVIT

I swear under penalty of perjury that the above statement is true and correct. I acknowledge that the disclosure applies to each family member (as defined by Section 176.001(2), Local Government Code) of this local government officer. I also acknowledge that this statement covers the 12-month period described by Section 176.003(a)(2)(B), Local Government Code.

\_\_\_\_\_  
Signature of Local Government Officer

AFFIX NOTARY STAMP / SEAL ABOVE

Sworn to and subscribed before me, by the said \_\_\_\_\_, this the \_\_\_\_\_ day  
of \_\_\_\_\_, 20 \_\_\_\_\_, to certify which, witness my hand and seal of office.

\_\_\_\_\_  
Signature of officer administering oath

\_\_\_\_\_  
Printed name of officer administering oath

\_\_\_\_\_  
Title of officer administering oath

## LOCAL GOVERNMENT OFFICER CONFLICTS DISCLOSURE STATEMENT

Section 176.003 of the Local Government Code requires certain local government officers to file this form. A "local government officer" is defined as a member of the governing body of a local governmental entity; a director, superintendent, administrator, president, or other person designated as the executive officer of a local governmental entity; or an agent of a local governmental entity who exercises discretion in the planning, recommending, selecting, or contracting of a vendor. This form is required to be filed with the records administrator of the local governmental entity not later than 5 p.m. on the seventh business day after the date on which the officer becomes aware of the facts that require the filing of this statement.

A local government officer commits an offense if the officer knowingly violates Section 176.003, Local Government Code. An offense under this section is a misdemeanor.

Refer to chapter 176 of the Local Government Code for detailed information regarding the requirement to file this form.

### INSTRUCTIONS FOR COMPLETING THIS FORM

*The following numbers correspond to the numbered boxes on the other side.*

- 1. Name of Local Government Officer.** Enter the name of the local government officer filing this statement.
- 2. Office Held.** Enter the name of the office held by the local government officer filing this statement.
- 3. Name of vendor described by Sections 176.001(7) and 176.003(a), Local Government Code.** Enter the name of the vendor described by Section 176.001(7), Local Government Code, if the vendor: a) has an employment or other business relationship with the local government officer or a family member of the officer as described by Section 176.003(a)(2)(A), Local Government Code; b) has given to the local government officer or a family member of the officer one or more gifts as described by Section 176.003(a)(2)(B), Local Government Code; or c) has a family relationship with the local government officer as defined by Section 176.001(2-a), Local Government Code.
- 4. Description of the nature and extent of each employment or other business relationship and each family relationship with vendor named in item 3.** Describe the nature and extent of the employment or other business relationship the vendor has with the local government officer or a family member of the officer as described by Section 176.003(a)(2)(A), Local Government Code, and each family relationship the vendor has with the local government officer as defined by Section 176.001(2-a), Local Government Code.
- 5. List gifts accepted, if the aggregate value of the gifts accepted from vendor named in item 3 exceeds \$100.** List gifts accepted during the 12-month period (described by Section 176.003(a)(2)(B), Local Government Code) by the local government officer or family member of the officer from the vendor named in item 3 that in the aggregate exceed \$100 in value.
- 6. Affidavit.** Signature of local government officer.

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**Local Government Code § 176.001(2-a):** "Family relationship" means a relationship between a person and another person within the third degree by consanguinity or the second degree by affinity, as those terms are defined by Subchapter B, Chapter 573, Government Code.

**Local Government Code § 176.003(a)(2)(A):**

(a) A local government officer shall file a conflicts disclosure statement with respect to a vendor if:

\*\*\*

(2) the vendor:

(A) has an employment or other business relationship with the local government officer or a family member of the officer that results in the officer or family member receiving taxable income, other than investment income, that exceeds \$2,500 during the 12-month period preceding the date that the officer becomes aware that:

- (i) a contract between the local governmental entity and vendor has been executed; or
- (ii) the local governmental entity is considering entering into a contract with the vendor.





**HISTORICALLY UNDERUTILIZED BUSINESS (HUB) DECLARATION**

The primary objective of the Hidalgo County HUB Program is to ensure Historically Underutilized Businesses receive a fair and equal opportunity for participation in the County's procurement process. This fact holds true for Services (Professional & Non-Professional), Commodities, and Construction contracts and any subcontracts thereto. The program strongly encourages Prime Contractors to provide subcontracting opportunities to Certified Hub Contractors/Vendors. Our goal for HUB contractor/vendor participation, as well as HUB subcontractor participation is 30%. To be considered as a "Certified HUB Contractor/Vendor" the contractor/vendor must have been certified by, and hold a current and valid certification with any of the three agencies listed below.

Have you been Certified as a HUB or an MBE/WBE source?:  Yes  No

If yes, by whom?:  Texas Building & Procurement Commission  Other \_\_\_\_\_

Indicate Certification No(s): \_\_\_\_\_ or Are Certificate(s) Attached?:  Yes  No

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**LIST OF CERTIFIED HUB SUBCONTRACTORS**

(Attach additional pages if necessary)

What percentage of the Bid, RFP, or RFQ is to be subcontracted with Certified HUB sources?: \_\_\_\_\_%  
(List HUB Subcontractor information below).

HUB Subcontractor Name: \_\_\_\_\_ HUB Status: \_\_\_\_\_  
Certifying Agency (Check all applicable):  Texas Building & Procurement Commission  Other  
Address: \_\_\_\_\_ City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_  
Contact Person: \_\_\_\_\_ Title: \_\_\_\_\_ Phone No.: ( ) \_\_\_\_\_  
Subcontract Amount: \$ \_\_\_\_\_ Description of Work to be Performed: \_\_\_\_\_

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HUB Subcontractor Name: \_\_\_\_\_ HUB Status: \_\_\_\_\_  
Certifying Agency (Check all applicable):  Texas Building & Procurement Commission  Other  
Address: \_\_\_\_\_ City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_  
Contact Person: \_\_\_\_\_ Title: \_\_\_\_\_ Phone No.: ( ) \_\_\_\_\_  
Subcontract Amount: \$ \_\_\_\_\_ Description of Work to be Performed: \_\_\_\_\_

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HUB Subcontractor Name: \_\_\_\_\_ HUB Status: \_\_\_\_\_  
Certifying Agency (Check all applicable):  Texas Building & Procurement Commission  Other  
Address: \_\_\_\_\_ City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_  
Contact Person: \_\_\_\_\_ Title: \_\_\_\_\_ Phone No.: ( ) \_\_\_\_\_  
Subcontract Amount: \$ \_\_\_\_\_ Description of Work to be Performed: \_\_\_\_\_

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**CONSTRUCTION  
CONTRACT**

This Agreement entered into this \_\_\_\_\_, **2018** by and between Hidalgo County acting by and through Hidalgo County Urban County Program, hereinafter called the "OWNER", acting herein through its County Judge and \_\_\_\_\_ (a corporation) (a partnership) (an individual) of \_\_\_\_\_, State of Texas, hereinafter called "CONTRACTOR".

**WITNESSETH**

That for and in consideration of the payments and agreements hereinafter mentioned, to be made and performed by the OWNER, the CONTRACTOR hereby agrees with the OWNER to commence and complete the construction described as follows:

- PROJECT NAME:** City of Hidalgo – 2016 Parks, Recreational Facility Improvements (Valle Alton Park)
- PROJECT No.:** 5016/17-35-0306-5000-3500-UCP-GVG
- PROJECT DESCRIPTION:** Street Improvements on Maro & Valle Street

hereinafter called the project, for the sum of (\$XXX,XXX.XX) – \_\_\_\_\_ and all extra work in connection therewith, under the terms as stated in the General and Special Conditions of the Contract; and at his (its or their) own proper cost and expense to furnish all the materials, supplies, machinery, equipment, tools, superintendence, labor, insurance, and other accessories and services necessary to complete the said project in accordance with the conditions and prices stated in the Proposal, the General Conditions, Supplemental General Conditions and Special Conditions of the contract, the plans, which include all maps, plats, blue prints, and other drawings and printed or written explanatory matter thereof, the specifications and contract documents therefore as prepared by **Javier Hinojosa Engineering** and as enumerated in Paragraph 1 of the Supplemental General Conditions, all of which are made a part hereof and collectively evidence and constitute the contract.

The CONTRACTOR hereby agrees to commence work under this contract on or after a date to be specified in a written "Notice to Proceed" of the OWNER and to fully complete the project within **(120) One hundred twenty** consecutive calendar days thereafter. The CONTRACTOR further agrees to pay, as liquidated damages, the sum of **(\$500.00) Five hundred dollars and zero cents** for each consecutive calendar day thereafter as hereinafter provided in Paragraph 19 of the General Conditions.

The OWNER agrees to pay the CONTRACTOR in current funds for the performance of the contract, subject to additions and deductions, as provided in the General Conditions of the contract, and to make payments on account thereof as provided in Paragraph 25, "Payments to Contractor", of the General Conditions.

IN WITNESS WHEREOF, the parties to these presents have executed this contract in four (4) counterparts, each of which shall be deemed an original, in year and day first above mentioned.





## URBAN COUNTY PROGRAM

427 E. Duranta Avenue, Suite 107 • Alamo, Texas 78516 • (956) 787-8127 FAX (956) 318-2988  
E-mail: [ucp@ucp.co.hidalgo.tx.us](mailto:ucp@ucp.co.hidalgo.tx.us)

September 13, 2018

\_\_\_\_\_  
Bidder's name

\_\_\_\_\_  
Address

\_\_\_\_\_  
City

\_\_\_\_\_  
State, Zip Code

**Re: Bid No: 5016/17-35-0306-5000-3500-UCP-GVG  
HIDALGO COUNTY – URBAN COUNTY PROGRAM  
Request for Bids-“ City of Hidalgo – 2016 Parks, Rec. Fac. Imp. (Valle Alto Park)”**

Dear Prospective Bidders:

Enclosed please find a Request for Bid (RFB) packet for your review and consideration. Additionally, in order to process the award of bid/contract resulting from this bid, the County is required, as of January 1, 2016, to comply with Texas Government Code, §2252.908, and the rules issued by the Texas Ethics Commission found in Title 1, Section 46.1, 46.3 and 46.5 of the Texas Administrative Code. In accordance with these requirements for the type of contract being considered, a business must submit a completed Certificate of Interested Parties Form 1295, (attached herein) to the County before the County may enter into a contract with the business entity.

In order for County staff to process the above referenced bid, you must complete Form 1295. You can find the 1295 form attached hereto or through the Texas Ethics Commissioner at the following website:

[https://www.ethics.state.tx.us/whatsnew/elf\\_info\\_form1295.htm](https://www.ethics.state.tx.us/whatsnew/elf_info_form1295.htm)

In box 3 of Form 1295, provide the Bid No.: 5016/17-35-0306-5000-3500-UCP-GVG shown above. Once completed, sign Form 1295 in front of a notary and have it notarized, thereafter, submit the Form 1295 to our office by the deadline stated below.

If you are the successful vendor then in order to maintain the schedule for presentation to Commissioners Court on **October 10, 2018**, the Form 1295 must be received in our office completed via fax to (956) 318-2988 or via email to: [guadalupe.garcia@co.hidalgo.tx.us](mailto:guadalupe.garcia@co.hidalgo.tx.us). Failure to timely submit Form 1295 may result in delay because Hidalgo County cannot enter into contract until Form 1295 is submitted.

Hidalgo County Urban County Program welcomes and appreciates your participation in the bid process.

If any further assistance is required, please do not hesitate to call the Urban County Program 956-787-8127.

Sincerely,

Diana R. Serna, Director  
Hidalgo County Urban County Program

DRS/ml  
Enclosures



# Request for Taxpayer Identification Number and Certification

Give Form to the  
requester. Do not  
send to the IRS.

▶ Go to [www.irs.gov/FormW9](http://www.irs.gov/FormW9) for instructions and the latest information.

Print or type.  
See Specific Instructions on page 3.

<b>1</b> Name (as shown on your income tax return). Name is required on this line; do not leave this line blank.	
<b>2</b> Business name/disregarded entity name, if different from above	
<b>3</b> Check appropriate box for federal tax classification of the person whose name is entered on line 1. Check only <b>one</b> of the following seven boxes. <input type="checkbox"/> Individual/sole proprietor or single-member LLC <input type="checkbox"/> Limited liability company. Enter the tax classification (C=C corporation, S=S corporation, P=Partnership) ▶ _____ <b>Note:</b> Check the appropriate box in the line above for the tax classification of the single-member owner. Do not check LLC if the LLC is classified as a single-member LLC that is disregarded from the owner unless the owner of the LLC is another LLC that is <b>not</b> disregarded from the owner for U.S. federal tax purposes. Otherwise, a single-member LLC that is disregarded from the owner should check the appropriate box for the tax classification of its owner. <input type="checkbox"/> Other (see instructions) ▶ _____	<b>4</b> Exemptions (codes apply only to certain entities, not individuals; see instructions on page 3): Exempt payee code (if any) _____ Exemption from FATCA reporting code (if any) _____ <i>(Applies to accounts maintained outside the U.S.)</i>
<b>5</b> Address (number, street, and apt. or suite no.) See instructions.	Requester's name and address (optional)
<b>6</b> City, state, and ZIP code	
<b>7</b> List account number(s) here (optional)	

## Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. The TIN provided must match the name given on line 1 to avoid backup withholding. For individuals, this is generally your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the instructions for Part I, later. For other entities, it is your employer identification number (EIN). If you do not have a number, see *How to get a TIN*, later.

**Note:** If the account is in more than one name, see the instructions for line 1. Also see *What Name and Number To Give the Requester* for guidelines on whose number to enter.

<b>Social security number</b>								
				-				
<b>or</b>								
<b>Employer identification number</b>								
				-				

## Part II Certification

Under penalties of perjury, I certify that:

1. The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me); and
2. I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding; and
3. I am a U.S. citizen or other U.S. person (defined below); and
4. The FATCA code(s) entered on this form (if any) indicating that I am exempt from FATCA reporting is correct.

**Certification instructions.** You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the certification, but you must provide your correct TIN. See the instructions for Part II, later.

Sign  
Here

Signature of  
U.S. person ▶

Date ▶

## General Instructions

Section references are to the Internal Revenue Code unless otherwise noted.

**Future developments.** For the latest information about developments related to Form W-9 and its instructions, such as legislation enacted after they were published, go to [www.irs.gov/FormW9](http://www.irs.gov/FormW9).

## Purpose of Form

An individual or entity (Form W-9 requester) who is required to file an information return with the IRS must obtain your correct taxpayer identification number (TIN) which may be your social security number (SSN), individual taxpayer identification number (ITIN), adoption taxpayer identification number (ATIN), or employer identification number (EIN), to report on an information return the amount paid to you, or other amount reportable on an information return. Examples of information returns include, but are not limited to, the following.

- Form 1099-INT (interest earned or paid)

- Form 1099-DIV (dividends, including those from stocks or mutual funds)
- Form 1099-MISC (various types of income, prizes, awards, or gross proceeds)
- Form 1099-B (stock or mutual fund sales and certain other transactions by brokers)
- Form 1099-S (proceeds from real estate transactions)
- Form 1099-K (merchant card and third party network transactions)
- Form 1098 (home mortgage interest), 1098-E (student loan interest), 1098-T (tuition)
- Form 1099-C (canceled debt)
- Form 1099-A (acquisition or abandonment of secured property)

Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN.

*If you do not return Form W-9 to the requester with a TIN, you might be subject to backup withholding. See What is backup withholding, later.*

By signing the filled-out form, you:

1. Certify that the TIN you are giving is correct (or you are waiting for a number to be issued),
2. Certify that you are not subject to backup withholding, or
3. Claim exemption from backup withholding if you are a U.S. exempt payee. If applicable, you are also certifying that as a U.S. person, your allocable share of any partnership income from a U.S. trade or business is not subject to the withholding tax on foreign partners' share of effectively connected income, and
4. Certify that FATCA code(s) entered on this form (if any) indicating that you are exempt from the FATCA reporting, is correct. See *What is FATCA reporting*, later, for further information.

**Note:** If you are a U.S. person and a requester gives you a form other than Form W-9 to request your TIN, you must use the requester's form if it is substantially similar to this Form W-9.

**Definition of a U.S. person.** For federal tax purposes, you are considered a U.S. person if you are:

- An individual who is a U.S. citizen or U.S. resident alien;
- A partnership, corporation, company, or association created or organized in the United States or under the laws of the United States;
- An estate (other than a foreign estate); or
- A domestic trust (as defined in Regulations section 301.7701-7).

**Special rules for partnerships.** Partnerships that conduct a trade or business in the United States are generally required to pay a withholding tax under section 1446 on any foreign partners' share of effectively connected taxable income from such business. Further, in certain cases where a Form W-9 has not been received, the rules under section 1446 require a partnership to presume that a partner is a foreign person, and pay the section 1446 withholding tax. Therefore, if you are a U.S. person that is a partner in a partnership conducting a trade or business in the United States, provide Form W-9 to the partnership to establish your U.S. status and avoid section 1446 withholding on your share of partnership income.

In the cases below, the following person must give Form W-9 to the partnership for purposes of establishing its U.S. status and avoiding withholding on its allocable share of net income from the partnership conducting a trade or business in the United States.

- In the case of a disregarded entity with a U.S. owner, the U.S. owner of the disregarded entity and not the entity;
- In the case of a grantor trust with a U.S. grantor or other U.S. owner, generally, the U.S. grantor or other U.S. owner of the grantor trust and not the trust; and
- In the case of a U.S. trust (other than a grantor trust), the U.S. trust (other than a grantor trust) and not the beneficiaries of the trust.

**Foreign person.** If you are a foreign person or the U.S. branch of a foreign bank that has elected to be treated as a U.S. person, do not use Form W-9. Instead, use the appropriate Form W-8 or Form 8233 (see Pub. 515, *Withholding of Tax on Nonresident Aliens and Foreign Entities*).

**Nonresident alien who becomes a resident alien.** Generally, only a nonresident alien individual may use the terms of a tax treaty to reduce or eliminate U.S. tax on certain types of income. However, most tax treaties contain a provision known as a "saving clause." Exceptions specified in the saving clause may permit an exemption from tax to continue for certain types of income even after the payee has otherwise become a U.S. resident alien for tax purposes.

If you are a U.S. resident alien who is relying on an exception contained in the saving clause of a tax treaty to claim an exemption from U.S. tax on certain types of income, you must attach a statement to Form W-9 that specifies the following five items.

1. The treaty country. Generally, this must be the same treaty under which you claimed exemption from tax as a nonresident alien.
2. The treaty article addressing the income.
3. The article number (or location) in the tax treaty that contains the saving clause and its exceptions.
4. The type and amount of income that qualifies for the exemption from tax.
5. Sufficient facts to justify the exemption from tax under the terms of the treaty article.

**Example.** Article 20 of the U.S.–China income tax treaty allows an exemption from tax for scholarship income received by a Chinese student temporarily present in the United States. Under U.S. law, this student will become a resident alien for tax purposes if his or her stay in the United States exceeds 5 calendar years. However, paragraph 2 of the first Protocol to the U.S.–China treaty (dated April 30, 1984) allows the provisions of Article 20 to continue to apply even after the Chinese student becomes a resident alien of the United States. A Chinese student who qualifies for this exception (under paragraph 2 of the first protocol) and is relying on this exception to claim an exemption from tax on his or her scholarship or fellowship income would attach to Form W-9 a statement that includes the information described above to support that exemption.

If you are a nonresident alien or a foreign entity, give the requester the appropriate completed Form W-8 or Form 8233.

## Backup Withholding

**What is backup withholding?** Persons making certain payments to you must under certain conditions withhold and pay to the IRS 28% of such payments. This is called "backup withholding." Payments that may be subject to backup withholding include interest, tax-exempt interest, dividends, broker and barter exchange transactions, rents, royalties, nonemployee pay, payments made in settlement of payment card and third party network transactions, and certain payments from fishing boat operators. Real estate transactions are not subject to backup withholding.

You will not be subject to backup withholding on payments you receive if you give the requester your correct TIN, make the proper certifications, and report all your taxable interest and dividends on your tax return.

**Payments you receive will be subject to backup withholding if:**

1. You do not furnish your TIN to the requester,
2. You do not certify your TIN when required (see the instructions for Part II for details),
3. The IRS tells the requester that you furnished an incorrect TIN,
4. The IRS tells you that you are subject to backup withholding because you did not report all your interest and dividends on your tax return (for reportable interest and dividends only), or
5. You do not certify to the requester that you are not subject to backup withholding under 4 above (for reportable interest and dividend accounts opened after 1983 only).

Certain payees and payments are exempt from backup withholding. See *Exempt payee code*, later, and the separate Instructions for the Requester of Form W-9 for more information.

Also see *Special rules for partnerships*, earlier.

## What is FATCA Reporting?

The Foreign Account Tax Compliance Act (FATCA) requires a participating foreign financial institution to report all United States account holders that are specified United States persons. Certain payees are exempt from FATCA reporting. See *Exemption from FATCA reporting code*, later, and the Instructions for the Requester of Form W-9 for more information.

## Updating Your Information

You must provide updated information to any person to whom you claimed to be an exempt payee if you are no longer an exempt payee and anticipate receiving reportable payments in the future from this person. For example, you may need to provide updated information if you are a C corporation that elects to be an S corporation, or if you no longer are tax exempt. In addition, you must furnish a new Form W-9 if the name or TIN changes for the account; for example, if the grantor of a grantor trust dies.

## Penalties

**Failure to furnish TIN.** If you fail to furnish your correct TIN to a requester, you are subject to a penalty of \$50 for each such failure unless your failure is due to reasonable cause and not to willful neglect.

**Civil penalty for false information with respect to withholding.** If you make a false statement with no reasonable basis that results in no backup withholding, you are subject to a \$500 penalty.

**Criminal penalty for falsifying information.** Willfully falsifying certifications or affirmations may subject you to criminal penalties including fines and/or imprisonment.

**Misuse of TINs.** If the requester discloses or uses TINs in violation of federal law, the requester may be subject to civil and criminal penalties.

## Specific Instructions

### Line 1

You must enter one of the following on this line; **do not** leave this line blank. The name should match the name on your tax return.

If this Form W-9 is for a joint account (other than an account maintained by a foreign financial institution (FFI)), list first, and then circle, the name of the person or entity whose number you entered in Part I of Form W-9. If you are providing Form W-9 to an FFI to document a joint account, each holder of the account that is a U.S. person must provide a Form W-9.

a. **Individual.** Generally, enter the name shown on your tax return. If you have changed your last name without informing the Social Security Administration (SSA) of the name change, enter your first name, the last name as shown on your social security card, and your new last name.

**Note: ITIN applicant:** Enter your individual name as it was entered on your Form W-7 application, line 1a. This should also be the same as the name you entered on the Form 1040/1040A/1040EZ you filed with your application.

b. **Sole proprietor or single-member LLC.** Enter your individual name as shown on your 1040/1040A/1040EZ on line 1. You may enter your business, trade, or "doing business as" (DBA) name on line 2.

c. **Partnership, LLC that is not a single-member LLC, C corporation, or S corporation.** Enter the entity's name as shown on the entity's tax return on line 1 and any business, trade, or DBA name on line 2.

d. **Other entities.** Enter your name as shown on required U.S. federal tax documents on line 1. This name should match the name shown on the charter or other legal document creating the entity. You may enter any business, trade, or DBA name on line 2.

e. **Disregarded entity.** For U.S. federal tax purposes, an entity that is disregarded as an entity separate from its owner is treated as a "disregarded entity." See Regulations section 301.7701-2(c)(2)(iii). Enter the owner's name on line 1. The name of the entity entered on line 1 should never be a disregarded entity. The name on line 1 should be the name shown on the income tax return on which the income should be reported. For example, if a foreign LLC that is treated as a disregarded entity for U.S. federal tax purposes has a single owner that is a U.S. person, the U.S. owner's name is required to be provided on line 1. If the direct owner of the entity is also a disregarded entity, enter the first owner that is not disregarded for federal tax purposes. Enter the disregarded entity's name on line 2, "Business name/disregarded entity name." If the owner of the disregarded entity is a foreign person, the owner must complete an appropriate Form W-8 instead of a Form W-9. This is the case even if the foreign person has a U.S. TIN.

### Line 2

If you have a business name, trade name, DBA name, or disregarded entity name, you may enter it on line 2.

### Line 3

Check the appropriate box on line 3 for the U.S. federal tax classification of the person whose name is entered on line 1. Check only one box on line 3.

IF the entity/person on line 1 is a(n) . . .	THEN check the box for . . .
• Corporation	Corporation
• Individual • Sole proprietorship, or • Single-member limited liability company (LLC) owned by an individual and disregarded for U.S. federal tax purposes.	Individual/sole proprietor or single-member LLC
• LLC treated as a partnership for U.S. federal tax purposes, • LLC that has filed Form 8832 or 2553 to be taxed as a corporation, or • LLC that is disregarded as an entity separate from its owner but the owner is another LLC that is not disregarded for U.S. federal tax purposes.	Limited liability company and enter the appropriate tax classification. (P= Partnership; C= C corporation; or S= S corporation)
• Partnership	Partnership
• Trust/estate	Trust/estate

### Line 4, Exemptions

If you are exempt from backup withholding and/or FATCA reporting, enter in the appropriate space on line 4 any code(s) that may apply to you.

#### Exempt payee code.

- Generally, individuals (including sole proprietors) are not exempt from backup withholding.
- Except as provided below, corporations are exempt from backup withholding for certain payments, including interest and dividends.
- Corporations are not exempt from backup withholding for payments made in settlement of payment card or third party network transactions.
- Corporations are not exempt from backup withholding with respect to attorneys' fees or gross proceeds paid to attorneys, and corporations that provide medical or health care services are not exempt with respect to payments reportable on Form 1099-MISC.

The following codes identify payees that are exempt from backup withholding. Enter the appropriate code in the space in line 4.

- 1—An organization exempt from tax under section 501(a), any IRA, or a custodial account under section 403(b)(7) if the account satisfies the requirements of section 401(f)(2)
- 2—The United States or any of its agencies or instrumentalities
- 3—A state, the District of Columbia, a U.S. commonwealth or possession, or any of their political subdivisions or instrumentalities
- 4—A foreign government or any of its political subdivisions, agencies, or instrumentalities
- 5—A corporation
- 6—A dealer in securities or commodities required to register in the United States, the District of Columbia, or a U.S. commonwealth or possession
- 7—A futures commission merchant registered with the Commodity Futures Trading Commission
- 8—A real estate investment trust
- 9—An entity registered at all times during the tax year under the Investment Company Act of 1940
- 10—A common trust fund operated by a bank under section 584(a)
- 11—A financial institution
- 12—A middleman known in the investment community as a nominee or custodian
- 13—A trust exempt from tax under section 664 or described in section 4947

The following chart shows types of payments that may be exempt from backup withholding. The chart applies to the exempt payees listed above, 1 through 13.

IF the payment is for . . .	THEN the payment is exempt for . . .
Interest and dividend payments	All exempt payees except for 7
Broker transactions	Exempt payees 1 through 4 and 6 through 11 and all C corporations. S corporations must not enter an exempt payee code because they are exempt only for sales of noncovered securities acquired prior to 2012.
Barter exchange transactions and patronage dividends	Exempt payees 1 through 4
Payments over \$600 required to be reported and direct sales over \$5,000 <sup>1</sup>	Generally, exempt payees 1 through 5 <sup>2</sup>
Payments made in settlement of payment card or third party network transactions	Exempt payees 1 through 4

<sup>1</sup> See Form 1099-MISC, Miscellaneous Income, and its instructions.

<sup>2</sup> However, the following payments made to a corporation and reportable on Form 1099-MISC are not exempt from backup withholding: medical and health care payments, attorneys' fees, gross proceeds paid to an attorney reportable under section 6045(f), and payments for services paid by a federal executive agency.

**Exemption from FATCA reporting code.** The following codes identify payees that are exempt from reporting under FATCA. These codes apply to persons submitting this form for accounts maintained outside of the United States by certain foreign financial institutions. Therefore, if you are only submitting this form for an account you hold in the United States, you may leave this field blank. Consult with the person requesting this form if you are uncertain if the financial institution is subject to these requirements. A requester may indicate that a code is not required by providing you with a Form W-9 with "Not Applicable" (or any similar indication) written or printed on the line for a FATCA exemption code.

A—An organization exempt from tax under section 501(a) or any individual retirement plan as defined in section 7701(a)(37)

B—The United States or any of its agencies or instrumentalities

C—A state, the District of Columbia, a U.S. commonwealth or possession, or any of their political subdivisions or instrumentalities

D—A corporation the stock of which is regularly traded on one or more established securities markets, as described in Regulations section 1.1472-1(c)(1)(i)

E—A corporation that is a member of the same expanded affiliated group as a corporation described in Regulations section 1.1472-1(c)(1)(i)

F—A dealer in securities, commodities, or derivative financial instruments (including notional principal contracts, futures, forwards, and options) that is registered as such under the laws of the United States or any state

G—A real estate investment trust

H—A regulated investment company as defined in section 851 or an entity registered at all times during the tax year under the Investment Company Act of 1940

I—A common trust fund as defined in section 584(a)

J—A bank as defined in section 581

K—A broker

L—A trust exempt from tax under section 664 or described in section 4947(a)(1)

M—A tax exempt trust under a section 403(b) plan or section 457(g) plan

**Note:** You may wish to consult with the financial institution requesting this form to determine whether the FATCA code and/or exempt payee code should be completed.

## Line 5

Enter your address (number, street, and apartment or suite number). This is where the requester of this Form W-9 will mail your information returns. If this address differs from the one the requester already has on file, write NEW at the top. If a new address is provided, there is still a chance the old address will be used until the payor changes your address in their records.

## Line 6

Enter your city, state, and ZIP code.

## Part I. Taxpayer Identification Number (TIN)

**Enter your TIN in the appropriate box.** If you are a resident alien and you do not have and are not eligible to get an SSN, your TIN is your IRS individual taxpayer identification number (ITIN). Enter it in the social security number box. If you do not have an ITIN, see *How to get a TIN* below.

If you are a sole proprietor and you have an EIN, you may enter either your SSN or EIN.

If you are a single-member LLC that is disregarded as an entity separate from its owner, enter the owner's SSN (or EIN, if the owner has one). Do not enter the disregarded entity's EIN. If the LLC is classified as a corporation or partnership, enter the entity's EIN.

**Note:** See *What Name and Number To Give the Requester*, later, for further clarification of name and TIN combinations.

**How to get a TIN.** If you do not have a TIN, apply for one immediately.

To apply for an SSN, get Form SS-5, Application for a Social Security Card, from your local SSA office or get this form online at [www.SSA.gov](http://www.SSA.gov). You may also get this form by calling 1-800-772-1213. Use Form W-7, Application for IRS Individual Taxpayer Identification Number, to apply for an ITIN, or Form SS-4, Application for Employer Identification Number, to apply for an EIN. You can apply for an EIN online by accessing the IRS website at [www.irs.gov/Businesses](http://www.irs.gov/Businesses) and clicking on Employer Identification Number (EIN) under Starting a Business. Go to [www.irs.gov/Forms](http://www.irs.gov/Forms) to view, download, or print Form W-7 and/or Form SS-4. Or, you can go to [www.irs.gov/OrderForms](http://www.irs.gov/OrderForms) to place an order and have Form W-7 and/or SS-4 mailed to you within 10 business days.

If you are asked to complete Form W-9 but do not have a TIN, apply for a TIN and write "Applied For" in the space for the TIN, sign and date the form, and give it to the requester. For interest and dividend payments, and certain payments made with respect to readily tradable instruments, generally you will have 60 days to get a TIN and give it to the requester before you are subject to backup withholding on payments. The 60-day rule does not apply to other types of payments. You will be subject to backup withholding on all such payments until you provide your TIN to the requester.

**Note:** Entering "Applied For" means that you have already applied for a TIN or that you intend to apply for one soon.

**Caution:** A disregarded U.S. entity that has a foreign owner must use the appropriate Form W-8.

## Part II. Certification

To establish to the withholding agent that you are a U.S. person, or resident alien, sign Form W-9. You may be requested to sign by the withholding agent even if item 1, 4, or 5 below indicates otherwise.

For a joint account, only the person whose TIN is shown in Part I should sign (when required). In the case of a disregarded entity, the person identified on line 1 must sign. Exempt payees, see *Exempt payee code*, earlier.

**Signature requirements.** Complete the certification as indicated in items 1 through 5 below.

**1. Interest, dividend, and barter exchange accounts opened before 1984 and broker accounts considered active during 1983.** You must give your correct TIN, but you do not have to sign the certification.

**2. Interest, dividend, broker, and barter exchange accounts opened after 1983 and broker accounts considered inactive during 1983.** You must sign the certification or backup withholding will apply. If you are subject to backup withholding and you are merely providing your correct TIN to the requester, you must cross out item 2 in the certification before signing the form.

**3. Real estate transactions.** You must sign the certification. You may cross out item 2 of the certification.

**4. Other payments.** You must give your correct TIN, but you do not have to sign the certification unless you have been notified that you have previously given an incorrect TIN. "Other payments" include payments made in the course of the requester's trade or business for rents, royalties, goods (other than bills for merchandise), medical and health care services (including payments to corporations), payments to a nonemployee for services, payments made in settlement of payment card and third party network transactions, payments to certain fishing boat crew members and fishermen, and gross proceeds paid to attorneys (including payments to corporations).

**5. Mortgage interest paid by you, acquisition or abandonment of secured property, cancellation of debt, qualified tuition program payments (under section 529), ABLÉ accounts (under section 529A), IRA, Coverdell ESA, Archer MSA or HSA contributions or distributions, and pension distributions.** You must give your correct TIN, but you do not have to sign the certification.

**What Name and Number To Give the Requester**

For this type of account:	Give name and SSN of:
1. Individual	The individual
2. Two or more individuals (joint account) other than an account maintained by an FFI	The actual owner of the account or, if combined funds, the first individual on the account <sup>1</sup>
3. Two or more U.S. persons (joint account maintained by an FFI)	Each holder of the account
4. Custodial account of a minor (Uniform Gift to Minors Act)	The minor <sup>2</sup>
5. a. The usual revocable savings trust (grantor is also trustee) b. So-called trust account that is not a legal or valid trust under state law	The grantor-trustee <sup>1</sup> The actual owner <sup>1</sup>
6. Sole proprietorship or disregarded entity owned by an individual	The owner <sup>3</sup>
7. Grantor trust filing under Optional Form 1099 Filing Method 1 (see Regulations section 1.671-4(b)(2)(i)(A))	The grantor <sup>*</sup>

For this type of account:	Give name and EIN of:
8. Disregarded entity not owned by an individual	The owner
9. A valid trust, estate, or pension trust	Legal entity <sup>4</sup>
10. Corporation or LLC electing corporate status on Form 8832 or Form 2553	The corporation
11. Association, club, religious, charitable, educational, or other tax-exempt organization	The organization
12. Partnership or multi-member LLC	The partnership
13. A broker or registered nominee	The broker or nominee

For this type of account:	Give name and EIN of:
14. Account with the Department of Agriculture in the name of a public entity (such as a state or local government, school district, or prison) that receives agricultural program payments	The public entity
15. Grantor trust filing under the Form 1041 Filing Method or the Optional Form 1099 Filing Method 2 (see Regulations section 1.671-4(b)(2)(i)(B))	The trust

<sup>1</sup> List first and circle the name of the person whose number you furnish. If only one person on a joint account has an SSN, that person's number must be furnished.

<sup>2</sup> Circle the minor's name and furnish the minor's SSN.

<sup>3</sup> You must show your individual name and you may also enter your business or DBA name on the "Business name/disregarded entity" name line. You may use either your SSN or EIN (if you have one), but the IRS encourages you to use your SSN.

<sup>4</sup> List first and circle the name of the trust, estate, or pension trust. (Do not furnish the TIN of the personal representative or trustee unless the legal entity itself is not designated in the account title.) Also see *Special rules for partnerships*, earlier.

**\*Note:** The grantor also must provide a Form W-9 to trustee of trust.

**Note:** If no name is circled when more than one name is listed, the number will be considered to be that of the first name listed.

**Secure Your Tax Records From Identity Theft**

Identity theft occurs when someone uses your personal information such as your name, SSN, or other identifying information, without your permission, to commit fraud or other crimes. An identity thief may use your SSN to get a job or may file a tax return using your SSN to receive a refund.

To reduce your risk:

- Protect your SSN,
- Ensure your employer is protecting your SSN, and
- Be careful when choosing a tax preparer.

If your tax records are affected by identity theft and you receive a notice from the IRS, respond right away to the name and phone number printed on the IRS notice or letter.

If your tax records are not currently affected by identity theft but you think you are at risk due to a lost or stolen purse or wallet, questionable credit card activity or credit report, contact the IRS Identity Theft Hotline at 1-800-908-4490 or submit Form 14039.

For more information, see Pub. 5027, Identity Theft Information for Taxpayers.

Victims of identity theft who are experiencing economic harm or a systemic problem, or are seeking help in resolving tax problems that have not been resolved through normal channels, may be eligible for Taxpayer Advocate Service (TAS) assistance. You can reach TAS by calling the TAS toll-free case intake line at 1-877-777-4778 or TTY/TDD 1-800-829-4059.

**Protect yourself from suspicious emails or phishing schemes.** Phishing is the creation and use of email and websites designed to mimic legitimate business emails and websites. The most common act is sending an email to a user falsely claiming to be an established legitimate enterprise in an attempt to scam the user into surrendering private information that will be used for identity theft.

The IRS does not initiate contacts with taxpayers via emails. Also, the IRS does not request personal detailed information through email or ask taxpayers for the PIN numbers, passwords, or similar secret access information for their credit card, bank, or other financial accounts.

If you receive an unsolicited email claiming to be from the IRS, forward this message to [phishing@irs.gov](mailto:phishing@irs.gov). You may also report misuse of the IRS name, logo, or other IRS property to the Treasury Inspector General for Tax Administration (TIGTA) at 1-800-366-4484. You can forward suspicious emails to the Federal Trade Commission at [spam@uce.gov](mailto:spam@uce.gov) or report them at [www.ftc.gov/complaint](http://www.ftc.gov/complaint). You can contact the FTC at [www.ftc.gov/idtheft](http://www.ftc.gov/idtheft) or 877-IDTHEFT (877-438-4338). If you have been the victim of identity theft, see [www.IdentityTheft.gov](http://www.IdentityTheft.gov) and Pub. 5027.

Visit [www.irs.gov/IdentityTheft](http://www.irs.gov/IdentityTheft) to learn more about identity theft and how to reduce your risk.

## Privacy Act Notice

Section 6109 of the Internal Revenue Code requires you to provide your correct TIN to persons (including federal agencies) who are required to file information returns with the IRS to report interest, dividends, or certain other income paid to you; mortgage interest you paid; the acquisition or abandonment of secured property; the cancellation of debt; or contributions you made to an IRA, Archer MSA, or HSA. The person collecting this form uses the information on the form to file information returns with the IRS, reporting the above information. Routine uses of this information include giving it to the Department of Justice for civil and criminal litigation and to cities, states, the District of Columbia, and U.S. commonwealths and possessions for use in administering their laws. The information also may be disclosed to other countries under a treaty, to federal and state agencies to enforce civil and criminal laws, or to federal law enforcement and intelligence agencies to combat terrorism. You must provide your TIN whether or not you are required to file a tax return. Under section 3406, payers must generally withhold a percentage of taxable interest, dividend, and certain other payments to a payee who does not give a TIN to the payer. Certain penalties may also apply for providing false or fraudulent information.

**Non-Collusion Affidavit  
Of Prime Bidder**

**State of Texas**            §  
   §  
**County of Hidalgo**    §

\_\_\_\_\_, being first duly sworn, deposes and says that:

(1) He \_\_\_\_\_, of \_\_\_\_\_, the Bidder that has submitted the attached Bid:

(2) He is fully informed respecting the preparation and contents of the attached Bid and of all pertinent circumstances respecting such bid:

(3) Such bid is genuine and is not a collusive or sham Bid:

(4) Neither the said Bidder nor any of its officers, partners, owners, agents, representatives, employees or parties in interest, including this affiant, has in any way colluded, conspired, connived or agreed, directly or indirectly with any other Bidder, firm or person to submit a collusive or sham Bid in connection with the Contract for which the attached Bid has been submitted or to refrain from bidding in connection with such Contract, or has in any manner, directly or indirectly, sought by agreement or collusion or communication or conference with any other Bidder, firm or person to fix the price or prices in the attached Bid or of any other Bidder, or to fix any overhead, profit or cost element of the Bid price of any other Bidder, or to secure through any collusion, conspiracy, connivance or unlawful agreement any advantage against the Owner or any person interested in the proposed Contract; and

(5) The price or prices quoted in the attached Bid are fair and proper and are not tainted by any collusion, conspiracy, connivance or unlawful agreement on the part of the Bidder or any of its agents, representatives, owners, employees, or parties in interest, including this affiant.

(Signed) \_\_\_\_\_

\_\_\_\_\_  
(Title)

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

\_\_\_\_\_  
\_\_\_\_\_  
(Title)

My Commission expires \_\_\_\_\_

**Certification  
Regarding Debarment, Suspension and Ineligibility**

As is required by the Federal Regulations Implementing Executive Order 12549, Debarment and Suspension, 45 CFR Part 76, Government-wide Debarment and Suspension, the applicant certifies, to the best of his or her knowledge and belief, that both it and its principals:

- a. Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any federal department or agency;
- b. Have not within a three-year period preceding this bid proposal and/or application been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (federal, state, or local) transaction or contract under a public transaction, violation of federal or state antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;
- c. Are not presently indicted for or otherwise criminally or civilly charged by a government entity with commission of any of the offenses enumerated herein; and
- d. Have not within a three-year period preceding this bid proposal and/or application had one or more public transactions terminated for cause or default.

Signature: \_\_\_\_\_  
Print Name: \_\_\_\_\_  
Title: \_\_\_\_\_  
DUNS No. : \_\_\_\_\_  
Telephone Number: \_\_\_\_\_  
Date: \_\_\_\_\_

If the bidder is unable to certify to all of the statements in this Certification, such bidder should attach an explanation to this proposal.

\*\*\*\*\*UCP STAFF ONLY\*\*\*\*\*

**VERIFICATION**

**DATE VERIFIED ON SAM:** \_\_\_\_\_

**HAS ACTIVE EXCLUSIONS?**      \_\_\_\_\_ **YES**      \_\_\_\_\_ **NO**

**UCP COORDINATOR NAME:** \_\_\_\_\_

**UCP COORDINATOR SIGNATURE:** \_\_\_\_\_



## **CONTRACTOR'S SECTION 3 PLAN**

\_\_\_\_\_ agrees to implement the specific following affirmative (Name of Contractor) action steps directed at increasing the utilization of lower income residents and businesses within the City/Precinct of \_\_\_\_\_.

- A. To ascertain from the locality's CDBG program official the exact boundaries of the Section 3 covered project area and where advantageous, seek the assistance of local officials in preparing and implementing the affirmative action plan.
- B. To attempt to recruit from within the city, the necessary number of lower income residents through: local advertising media, signs placed at the proposed site for the project, and community organizations and public or private institutions operating within and servicing the project area such as Service Employment and Redevelopment (SER), Opportunities Industrialization Center (OIC), Urban League, Concentrated Employment Program, Hometown Plan, or the U.S. Employment Service.
- C. To maintain a list of all lower income residents who have applied either on their own or on referral from any source, and to employ such persons, if otherwise eligible and if a vacancy exists.
- D. To insert this Section 3 plan in all bid documents and to require all bidders on subcontracts to submit a Section 3 affirmative action plan including utilization goals and the specific steps planned to accomplish these goals.
- E. To insure that subcontracts (greater than \$10,000) which are typically let on a negotiated rather than on a bid basis in areas other than the Section 3 covered project areas are also let on a negotiated basis, whenever feasible, will let in a Section 3 covered project area.
- F. To formally contact unions, subcontractors, and trade associations to secure their cooperation in this effort.
- G. To insure that all appropriate project area business concerns are notified of pending subcontractual opportunities.
- H. To maintain records, including copies of correspondence, memoranda, etc., which document that all of the above affirmative action steps have been taken.
- I. To appoint or recruit an executive official of the company or agency as Equal Opportunity Officer to coordinate the implementation of this Section 3 plan.
- J. To maintain records concerning the amount and number of contracts subcontracts, and purchases which contribute to Section 3 objectives.
- K. To maintain records of all projected workforce needs for all phases of the project by occupation, trade, skill level, and number of positions and to update these projections based on the extent to which hiring meets Section 3 objectives.

Rio Grande Valley Entitlement Communities Section 3 Plan

As officers and representative of \_\_\_\_\_, We the undersigned have read  
(name of company)

and fully agree to the Section 3 Affirmative Action Plan, and become a party to the full implementation of the program and its provisions.

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

\_\_\_\_\_  
Printed Name & Title

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

**EXHIBIT A**

**CERTIFICATION FOR BUSINESS CONCERNS SEEKING SECTION 3 PREFERENCE IN CONTRACTING AND DEMONSTRATION OF CAPABILITY**

Name of Business \_\_\_\_\_

Address of Business \_\_\_\_\_

Type of Business/Trade/Profession \_\_\_\_\_

- Type of Business:       Corporation                       Partnership  
                                  Sole Proprietorship               Joint Venture

Attached is the following documentation as evidence of status:

**For Business claiming status as a Section 3 resident-owned business concern (51% of business owner(s)) are Section 3 Residents:**

- Self Certification                       Other

**For Business entity as applicable:**

- Copy of Articles of Incorporation               Certificate of Good Standing  
 Assumed Business Name Certificate               Partnership Agreement  
 List of Business Name Certificate               Corporation Annual Report  
% ownership of each                       Latest Board minutes appointing officers  
 Organization chart with names and titles and brief function statement  Additional documentation

**For Business claiming Section 3, claiming at least 30 percent of their workforce are currently Section 3 residents or were Section 3 eligible residents within 3 years of date of first employment with the business:**

- List of all current full-time employees               List of employees claiming Section 3 status  
 PHA/IHA Residential lease less than 3 years from day of employment               Other evidence of Section 3 status less than 3 years from date of employment

**For Business claiming Section 3 status by subcontracting 25 percent of dollar awarded to qualified Section 3 business:**

- List of subcontracted Section 3 business(es) and subcontract amount

**Evidence of ability to perform successfully under the terms and conditions of the proposed contract:**

- Current financial statement  
 Statement of ability to comply with public policy  
 List of owned equipment  
 List of all contracts for the past two years

\_\_\_\_\_  
Authorizing Name and Signature

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

Attested by: \_\_\_\_\_

Received by : \_\_\_\_\_

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

**EXHIBIT B**

**ASSURANCE OF COMPLIANCE (Section 3, HUD ACT of 1968)**

**TRAINING, EMPLOYMENT, AND CONTRACTING OPPORTUNITIES FOR BUSINESS AND LOWER INCOME PERSONS**

- A. The project assisted under this (contract) (agreement) is subject to the requirements of Section 3 of the Housing and Urban Development Act of 1968, as amended, 12 U.S.C. 1701u. Section 3 requires that to the greatest extent feasible opportunities for training and employment be given to lower income residents of the project area and contracts for work in connection with the project be awarded to business concerns which are located in or owned in substantial part by persons residing in the area of the project.
  
- B. Notwithstanding any other provision of this (contract) (agreement), the (applicant) (recipient) shall carry out the provisions of said Section 3 and the regulations issued pursuant thereto by the Secretary set forth in 24 CFR Part 135 (published in 38 Federal Register 29220, October 23, 1973), and all applicable rules and orders of the Secretary issued thereunder prior to the execution of this (contract) (agreement). The requirements of said regulations include but are not limited to development and implementation of an affirmative action plan for utilizing Section 3 business concerns located within or owned in substantial part by persons residing in the area of the project; the making of a good faith effort, as defined by the regulation, to provide training, employment and business opportunities required by Section 3; and incorporation of the "Section 3 Clause" specified by Section 135.38 of the regulation in all contracts for work in connection with the project. The (applicant) (recipient) certifies and agrees that it is under no contractual or other disability which would prevent it from complying with these requirements.
  
- C. Compliance with the provisions of Section 3, the regulations set forth in 24 CFR Part 135, and all applicable rules and orders of the Secretary issued thereunder prior to approval by the Government of the application for this (contract) (agreement), shall be a condition of the Federal financial assistance provided to the project, binding upon the (applicant) (recipient), its successors and assigns. Failure to fulfill these requirements shall subject the (applicant) (recipient), its contractors and subcontractors, its successors, and assigns to the sanctions specified by the (contract) (agreement), and to such sanctions as are specified by 24 CFR 135.38 (f).

APPLICANT: \_\_\_\_\_

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

ADDRESS: \_\_\_\_\_

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

Rio Grande Valley Entitlement Communities Section 3 Plan  
**EXHIBIT C**

**CONTRACTOR/SUBCONTRACTOR CERTIFICATION REGARDING  
SECTION 3 AND SEGREGATED FACILITIES**

\_\_\_\_\_  
**COMPANY'S NAME**

\_\_\_\_\_  
**PROJECT NAME**

The undersigned hereby certifies that:

- (a) Section 3 provisions are included in the Contract.
- (b) The above stated company is a signatory to the developer's Section 3 Plan.
- (c) No segregated facilities will be maintained as required by Title VI of the Civil Rights Act of 1964.

\_\_\_\_\_  
**NAME AND TITLE OF SIGNER (PRINT OR TYPE)**

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

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

**EXHIBIT D**

**CONTRACTOR'S SECTION 3 PLAN**

\_\_\_\_\_ agrees to implement the specific following affirmative action steps directed at increasing the utilization of lower income residents and businesses within the City/County of \_\_\_\_\_.

- A. To ascertain from the locality's CDBG program official the exact boundaries of the Section 3 covered project area and where advantageous, seek the assistance of local officials in preparing and implementing the affirmative action plan.
- B. To attempt to recruit from within the city/county/MSA, the necessary number of lower income residents through: local advertising media, signs placed at the proposed site for the project, and community organizations and public or private institutions operating within and servicing the project area.
- C. To maintain a list of all lower income residents who have applied either on their own or on referral from any source, and to employ such persons, if otherwise eligible and if a vacancy exists.
- D. To insert this Section 3 plan in all bid documents and to require all bidders on subcontracts to submit a Section 3 affirmative action plan including utilization goals and the specific steps planned to accomplish these goals.
- E. To insure that subcontractors adhere to the Section 3 provisions that are applicable to the Contractor.
- F. To insure that all appropriate project area business concerns are notified of pending subcontractual opportunities.
- G. To maintain records, including copies of correspondence, memoranda, etc., which document that all of the above affirmative action steps have been taken.
- H. To appoint or recruit an executive official of the company or agency as Equal Opportunity Officer to coordinate the implementation of this Section 3 plan.
- I. To maintain records concerning the amount and number of contracts, subcontracts, and purchases which contribute to Section 3 objectives.
- J. To maintain records of all projected workforce needs for all phases of the project by occupation, trade, skill level, and number of positions and to update these projections based on the extent to which hiring meets Section 3 objectives.

As officers and representatives of \_\_\_\_\_(Company),

We the undersigned have read and fully agree to the Section 3 Affirmative Action Plan, and become a party to the full implementation of the program and its provisions.

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Title

\_\_\_\_\_  
Date

\_\_\_\_\_  
Title

\_\_\_\_\_  
Date

**EXHIBIT E**

**Section 3 Clause**

All Section 3 covered contracts shall include the following clause (referred to as the Section 3 Clause):

A. The work to be performed under this contract is subject to the requirements of Section 3 of the Housing and Urban Development Act of 1968, as amended, 12 U.S.C. 1701u (Section 3). The purpose of Section 3 is to ensure that employment and other economic opportunities generated by HUD assistance or HUD- assisted projects covered by Section 3, shall, to the greatest extent feasible, be directed to low-and very low-income persons, particularly person who are recipients of HUD assistance for housing.

B. The parties to this contract agree to comply with HUD's regulations in 24 CFR Part 135, which implement Section 3. As evidenced by their execution of this contract, the parties to this contract certify that they are under no contractual or other impediment that would prevent them from complying with the part 135 regulations.

C. The contractor agrees to send to each labor organization or representative or workers with which the contractor has a collective bargaining agreement or other understanding, if any a notice advising the labor organization or workers' representative of the contractor's commitments under the Section 3 clause, and will post copies of the notice in conspicuous places at the work site where both employees and applicants for training and employment positions can see the notice. The notice shall describe the Section 3 preference, shall set forth minimum number and job titles subject to hire, availability of apprenticeship and training positions, the qualifications for each; and the name and location of the person(s) taking applications for each of the positions; and the anticipated date the work shall begin.

D. The contractor agrees to include this Section 3 clause in every subcontract subject to compliance with regulations in 24 CFR part 135, and agrees to take appropriate action, as provided in an applicable provision of the subcontract or in this Section 3 clause, upon a finding that the subcontractor is in violation of the regulations in 24 CFR part 135. The contractor will not subcontract with any subcontractor where the contractor has notice or knowledge that the subcontractor has been found in violation of the regulations in 24 CFR part 135.

E. The contractor will certify that any vacant employment positions, including training positions, that are filled (1) after the contractor is selected but before the contract is executed, and (2) with persons other than those to whom the regulations of 24 CFR part 135 require employment opportunities to be directed, were not filled to circumvent the contractor's obligations under 24 CFR part 135.

F. Noncompliance with HUD's regulations in 24 CFR part 135 may result in sanctions, termination of this contract for default, and debarment or suspension from future HUD assisted contracts.

G. With respect to work performed in connection with Section 3 covered Indian housing assistance, section 7(b) of the Indian Self-Determination and Education Assistance Act. (25 U.S.C 450e) also applies to the work to be performed under this contract. Section 7(b) requires that to the greatest extent feasible (i) preference and opportunities for training and employment shall be give to Indians, and (ii) preference in the award of contracts and subcontracts shall be given to Indian organizations and Indian-owned Economic Enterprises. Parties to this contract that are subject to the provisions of Section 3 and section 7(b) agree to comply with Section 3 to the maximum extent feasible, but not in derogation of compliance with section 7(b).

**EXHIBIT F**  
**POSTED NOTICE TO PROJECT RESIDENTS**

The project \_\_\_\_\_  
is being funded by the U.S. Department of Housing and Urban Development under the \_\_\_\_\_ -  
Community Development Block Grant Program. This notice complies with the RGVECs \_\_\_\_\_  
Section 3 Plan and is intended to inform the public, in particular project residents, of the economic  
opportunities (jobs) created through the use of the federal award.

Contractor/subcontractor intends to hire for the following positions:

Number of Jobs	Title	Description of Qualifications/Licensure /Certification

Section 3 preferences:

1. Persons residing in the project area and who are of low- to very-low- income
2. Participants in HUD Youthbuild
3. Homeless Persons
4. Residents of the local Public Housing Authority
5. Residents of the local Section 8 Housing Assistance Program units

For more information including job applications, apprenticeships, training positions, and qualifications,  
contact:

Name of Contractor \_\_\_\_\_  
Contact Person \_\_\_\_\_  
Address \_\_\_\_\_  
City, State, Zip \_\_\_\_\_  
Phone \_\_\_\_\_

Estimated construction start date is \_\_\_\_\_



**EXHIBIT G  
ESTIMATED WORKFORCE BREAKDOWN**

NAME OF BUSINESS/CONTRACTOR/SUBCONTRACTOR \_\_\_\_\_

COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4	COLUMN 5
JOB CATEGORY	TOTAL ESTIMATE POSITIONS	NO. POSITIONS CURRENTLY OCCUPIED BY PERMANENT EMPLOYEES	NO. POSITIONS NOT CURRENTLY OCCUPIED	NO. POSITIONS TO BE FILLED WITH SECTION 3 RESIDENTS/LOW INCOME PERSONS *
OFFICERS SUPERVISORS				
PROFESSIONALS				
TECHNICIANS				
HOUSING SALES/RENTAL MANAGEMENT				
OFFICE CLERICAL				
SERVICE WORKERS				
OTHERS				

TRADE: Plumbing/Electrical/HVAC/Construction/Other: \_\_\_\_\_

JOURNEYMEN				
COMMON LABORERS				
APPRENTICES				
MAXIMUM NO. OF TRAINEES				

TRADE: Plumbing/Electrical/HVAC/Construction/Other: \_\_\_\_\_

JOURNEYMEN				
COMMON LABORERS				
APPRENTICES				
MAXIMUM NO. OF TRAINEES				

TRADE: Plumbing/Electrical/HVAC/Construction/Other: \_\_\_\_\_

JOURNEYMEN				
COMMON LABORERS				
APPRENTICES				
MAXIMUM NO. OF TRAINEES				

TRADE: Plumbing/Electrical/HVAC/Construction/Other: \_\_\_\_\_

JOURNEYMEN				
COMMON LABORERS				
APPRENTICES				
MAXIMUM NO. OF TRAINEES				

\* A Section 3 Resident is 1) a public housing resident; or 2) a low or very low income person residing in the metropolitan area or non – metropolitan county where the project is located.

**ALL NEW HIRES MUST COMPLETE AN INCOME DOCUMENTATION CERTIFICATION—SEE EXHIBITS K AND L.**

**EXHIBIT H**

**SECTION 3 MONTHLY COMPLIANCE FORM**

Contractor and all subcontractor(s) must sign, date and deliver this form monthly to:

RGVEC: \_\_\_\_\_ Project Name: \_\_\_\_\_

RGVEC Address: \_\_\_\_\_ Project Location: \_\_\_\_\_

For the Month of \_\_\_\_\_

**I. Hiring**

Select one:

I have not hired any new employees during the month specified.

I have hired \_\_\_\_\_ Section 3 employees and/or \_\_\_\_\_ non-Section 3 employees during the month.

**I. Recruitment**

I have taken one or more of the following recruitment steps to hire a Section 3 resident with the highest training and employment priority ranking: (check all that apply)

I have advertised to fill vacancy(ies) at the site(s), where work is taking place, in connection with this project. Below, I have checked the steps I have taken to find Section 3 low-income residents, from the targeted groups and neighborhoods, to fill any vacancies.

Placed signs or posters in prominent places at project site(s).

Taken photographs of the above item to document that the above step was carried out.

Distributed employment flyers to the administrative office of the local Public Housing Authority.

Contacted RGVECs employment referrals or Youthbuild Program referrals.

Kept a log of all applicants and indicated the reasons why Section 3 residents who applied were not hired.

Retained copies of any employment applications completed by Public Housing Authority, Section 8 certificate or voucher holders or other Section 3 residents.

Sent a notice about Section 3 training and employment requirements and opportunities to labor organizations or to worker representatives with whom our firm has a collective bargaining or other agreement.

**II. Verification**

I have attached proof of all checked items.

I hereby certify that the above information is a true and correct.

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Title

\_\_\_\_\_  
Date

\_\_\_\_\_  
Business Name

**EXHIBIT I**

**MONTHLY EMPLOYMENT UTILIZATION REPORT**

TO: City/County

FROM: \_\_\_\_\_

Hidalgo County Urban County Program

(Contractor)  
ADDRESS OF CONTRACTOR

NAME OF PROJECT: \_\_\_\_\_

\_\_\_\_\_  
Street

Bid No. 2012-

\_\_\_\_\_  
City, State

GRANT NUMBER:  
B-08 THRU B-12-MC-48-0504

CONTRACTOR'S PHONE NUMBER:  
\_\_\_\_\_  
( )

REPORTING PERIOD: \_\_\_\_\_

PERCENTAGE OF PROJECT COMPLETION: \_\_\_\_\_

CLASSIFICATION	WORK HOURS OF EMPLOYMENT ON THIS PROJECT								
	TOTAL	BLACK	WHITE	ASIAN OR PACIFIC ISLANDER	HISPANIC	FEMALE	DISABLED	VETERAN	SECTION 3 RESIDENT
OFFICERS									
SUPERVISORS									
PROFESSIONALS									
TECHNICIANS									
HOUSING SALES/RENTAL MANAGEMENT									
OFFICE CLERICAL									
SERVICE WORKERS									
JOURNEYMEN									
COMMON LABORERS									
APPRENTICES									
TRAINEES									
<b>TOTAL</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

% OF MINORITY EMPLOYEES                      0 #DIV/0!  
 % FEMALE EMPLOYEES                                #DIV/0!  
 % LOW INCOME/SECTION 3 EMPLOYEES           #DIV/0!  
 % HANDICAPPED EMPLOYEES                      #DIV/0!

\_\_\_\_\_  
SIGNATURE AND TITLE OF COMPANY OFFICIAL COMPLETING REPORT

DATE SIGNED \_\_\_\_\_

This form must be completed monthly by the General Contractor for all workers

**EXHIBIT J**

**SECTION 3 EMPLOYEE DATA & CERTIFICATION**

The U.S. Department of Housing and Urban Development (HUD) requires that the County/City of \_\_\_\_\_ document the income of newly hired persons working on federally-funded construction projects. This form is intended to comply with HUD Community Development Block Grant requirements.

Applicant's Name: \_\_\_\_\_ Job Title: \_\_\_\_\_

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

How many people are in your family? (Circle one) 1 2 3 4 5 6 7 8+

What is your family's gross annual income (before taxes)? \_\_\_\_\_

What is your race? (Circle one)

**WHITE**

**BLACK/AFRICAN AMERICAN**

**ASIAN**

**AMERICAN INDIAN/ALASKAN NATIVE**

**NATIVE HAWAIIAN/OTHER PACIFIC ISLANDER**

**ASIAN & WHITE**

**BLACK & WHITE**

**AM. INDIAN/ALASKAN NATIVE & BLACK**

**OTHER MULTIRACIAL**

Is your family of Hispanic origin? (Circle one) YES NO

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

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date Employee's

EXHIBIT K

SECTION 3 EMPLOYEE DATA & CERTIFICATION

El Departamento de Vivienda y Desarrollo Urbano (HUD) requiere que la Ciudad de \_\_\_\_\_ obtenga documentos de ingresos de las personas nuevamente empleadas que trabajan en los proyectos que reciben beneficios de programas federales. Esta forma es requerida para cumplir con los requisitos de Subvención de Bloque de Desarrollo de Comunidad de HUD.

FAVOR DE ESCRIBIR A LETRA DE MOLDE

Seccion I

Nombre del Participante \_\_\_\_\_ Titulo de Trabajo \_\_\_\_\_

Direccion \_\_\_\_\_ Telefono \_\_\_\_\_

Seccion II

¿**Cuántos personas en su Familia ?** (Circule uno)

¿Cuál es dinero anual gruesa de su familia (antes de impuestos)? \_\_\_\_\_

¿Cuál es su raza? (Circule uno)

**AMERICANO**

**NEGRO/ AMERICANO AFRICANO**

**ASIÁTICO**

**INDIO AMERICANO/NATURAL DE ALASKA**

**NATURAL DE HAWAII/ EL OTRO ISLEÑO PACÍFICO**

**ASIÁTICO & AMERICANO**

**AMERICANO AFRICANO & AMERICANO**

**INDIA AMERICANO/NATURAL DE ALASKA & AMERICANO AFRICANO**

**EL OTRO MULTI-RACIAL**

¿Está su familia de origen hispanico?(Circule uno)      **Sí**                              **No**

Certifico que toda la información antedicha está verdad y correcta al mejor de mi conocimiento.

\_\_\_\_\_  
Firma del Empleado

\_\_\_\_\_  
Fecha

**SUB-CONTRACTOR'S SECTION 3  
PLAN**

\_\_\_\_\_ agrees to implement the specific following affirmative  
(Name of Contractor)

action steps directed at increasing the utilization of lower income residents and businesses within the  
City/Precinct of \_\_\_\_\_.

- A. To ascertain from the locality's CDBG program official the exact boundaries of the Section 3 covered project area and where advantageous, seek the assistance of local officials in preparing and implementing the affirmative action plan.
- B. To attempt to recruit from within the city, the necessary number of lower income residents through: local advertising media, signs placed at the proposed site for the project, and community organizations and public or private institutions operating within and servicing the project area such as Service Employment and Redevelopment (SER), Opportunities Industrialization Center (OIC), Urban League, Concentrated Employment Program, Hometown Plan, or the U.S. Employment Service.
- C. To maintain a list of all lower income residents who have applied either on their own or on referral from any source, and to employ such persons, if otherwise eligible and if a vacancy exists.
- D. To insert this Section 3 plan in all bid documents and to require all bidders on subcontracts to submit a Section 3 affirmative action plan including utilization goals and the specific steps planned to accomplish these goals.
- E. To insure that subcontracts (greater than \$10,000) which are typically let on a negotiated rather than on a bid basis in areas other than the Section 3 covered project areas are also let on a negotiated basis, whenever feasible, will let in a Section 3 covered project area.
- F. To formally contact unions, subcontractors, and trade associations to secure their cooperation in this effort.
- G. To insure that all appropriate project area business concerns are notified of pending subcontractual opportunities.
- H. To maintain records, including copies of correspondence, memoranda, etc., which document that all of the above affirmative action steps have been taken.
- I. To appoint or recruit an executive official of the company or agency as Equal Opportunity Officer to coordinate the implementation of this Section 3 plan.

Rio Grande Valley Entitlement Communities Section 3 Plan

- J. To maintain records concerning the amount and number of contracts subcontracts, and purchases which contribute to Section 3 objectives.
- K. To maintain records of all projected workforce needs for all phases of the project by occupation, trade, skill level, and number of positions and to update these projections based on the extent to which hiring meets Section 3 objectives.

As officers and representative of \_\_\_\_\_,  
(name of company)

We the undersigned have read and fully agree to the Section 3 Affirmative Action Plan, and become a party to the full implementation of the program and its provisions.

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

\_\_\_\_\_  
Printed Name & Title

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

**EXHIBIT A**

**CERTIFICATION FOR BUSINESS CONCERNS SEEKING SECTION 3 PREFERENCE IN CONTRACTING AND DEMONSTRATION OF CAPABILITY**

Name of Business \_\_\_\_\_

Address of Business \_\_\_\_\_

Type of Business/Trade/Profession \_\_\_\_\_

- Type of Business:       Corporation                       Partnership  
                                  Sole Proprietorship               Joint Venture

Attached is the following documentation as evidence of status:

**For Business claiming status as a Section 3 resident-owned business concern (51% of business owner(s)) are Section 3 Residents:**

- Self Certification                       Other

**For Business entity as applicable:**

- Copy of Articles of Incorporation               Certificate of Good Standing  
 Assumed Business Name Certificate               Partnership Agreement  
 List of Business Name Certificate               Corporation Annual Report  
% ownership of each                       Latest Board minutes appointing officers  
 Organization chart with names and titles and brief function statement  Additional documentation

**For Business claiming Section 3, claiming at least 30 percent of their workforce are currently Section 3 residents or were Section 3 eligible residents within 3 years of date of first employment with the business:**

- List of all current full-time employees               List of employees claiming Section 3 status  
 PHA/IHA Residential lease less than 3 years from day of employment               Other evidence of Section 3 status less than 3 years from date of employment

**For Business claiming Section 3 status by subcontracting 25 percent of dollar awarded to qualified Section 3 business:**

- List of subcontracted Section 3 business(es) and subcontract amount

Evidence of ability to perform successfully under the terms and conditions of the proposed contract:

- Current financial statement  
 Statement of ability to comply with public policy  
 List of owned equipment  
 List of all contracts for the past two years

\_\_\_\_\_  
Authorizing Name and Signature

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

Attested by: \_\_\_\_\_

Received by : \_\_\_\_\_

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



**EXHIBIT B**

**ASSURANCE OF COMPLIANCE (Section 3, HUD ACT of 1968)**

**TRAINING, EMPLOYMENT, AND CONTRACTING OPPORTUNITIES FOR BUSINESS AND LOWER INCOME PERSONS**

- A. The project assisted under this (contract) (agreement) is subject to the requirements of Section 3 of the Housing and Urban Development Act of 1968, as amended, 12 U.S.C. 1701u. Section 3 requires that to the greatest extent feasible opportunities for training and employment be given to lower income residents of the project area and contracts for work in connection with the project be awarded to business concerns which are located in or owned in substantial part by persons residing in the area of the project.
  
- B. Notwithstanding any other provision of this (contract) (agreement), the (applicant) (recipient) shall carry out the provisions of said Section 3 and the regulations issued pursuant thereto by the Secretary set forth in 24 CFR Part 135 (published in 38 Federal Register 29220, October 23, 1973), and all applicable rules and orders of the Secretary issued thereunder prior to the execution of this (contract) (agreement). The requirements of said regulations include but are not limited to development and implementation of an affirmative action plan for utilizing Section 3 business concerns located within or owned in substantial part by persons residing in the area of the project; the making of a good faith effort, as defined by the regulation, to provide training, employment and business opportunities required by Section 3; and incorporation of the "Section 3 Clause" specified by Section 135.38 of the regulation in all contracts for work in connection with the project. The (applicant) (recipient) certifies and agrees that it is under no contractual or other disability which would prevent it from complying with these requirements.
  
- C. Compliance with the provisions of Section 3, the regulations set forth in 24 CFR Part 135, and all applicable rules and orders of the Secretary issued thereunder prior to approval by the Government of the application for this (contract) (agreement), shall be a condition of the Federal financial assistance provided to the project, binding upon the (applicant) (recipient), its successors and assigns. Failure to fulfill these requirements shall subject the (applicant) (recipient), its contractors and subcontractors, its successors, and assigns to the sanctions specified by the (contract) (agreement), and to such sanctions as are specified by 24 CFR 135.38 (f).

APPLICANT: \_\_\_\_\_

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

ADDRESS: \_\_\_\_\_

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

**EXHIBIT C**

**CONTRACTOR/SUBCONTRACTOR CERTIFICATION REGARDING  
SECTION 3 AND SEGREGATED FACILITIES**

\_\_\_\_\_  
**COMPANY'S NAME**

\_\_\_\_\_  
**PROJECT NAME**

The undersigned hereby certifies that:

- (a) Section 3 provisions are included in the Contract.
- (b) The above stated company is a signatory to the developer's Section 3 Plan.
- (c) No segregated facilities will be maintained as required by Title VI of the Civil Rights Act of 1964.

\_\_\_\_\_  
**NAME AND TITLE OF SIGNER (PRINT OR TYPE)**

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

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

**EXHIBIT D**

**CONTRACTOR'S SECTION 3 PLAN**

\_\_\_\_\_ agrees to implement the specific following affirmative action steps directed at increasing the utilization of lower income residents and businesses within the City/County of \_\_\_\_\_.

- A. To ascertain from the locality's CDBG program official the exact boundaries of the Section 3 covered project area and where advantageous, seek the assistance of local officials in preparing and implementing the affirmative action plan.
- B. To attempt to recruit from within the city/county/MSA, the necessary number of lower income residents through: local advertising media, signs placed at the proposed site for the project, and community organizations and public or private institutions operating within and servicing the project area.
- C. To maintain a list of all lower income residents who have applied either on their own or on referral from any source, and to employ such persons, if otherwise eligible and if a vacancy exists.
- D. To insert this Section 3 plan in all bid documents and to require all bidders on subcontracts to submit a Section 3 affirmative action plan including utilization goals and the specific steps planned to accomplish these goals.
- E. To insure that subcontractors adhere to the Section 3 provisions that are applicable to the Contractor.
- F. To insure that all appropriate project area business concerns are notified of pending subcontractual opportunities.
- G. To maintain records, including copies of correspondence, memoranda, etc., which document that all of the above affirmative action steps have been taken.
- H. To appoint or recruit an executive official of the company or agency as Equal Opportunity Officer to coordinate the implementation of this Section 3 plan.
- I. To maintain records concerning the amount and number of contracts, subcontracts, and purchases which contribute to Section 3 objectives.
- J. To maintain records of all projected workforce needs for all phases of the project by occupation, trade, skill level, and number of positions and to update these projections based on the extent to which hiring meets Section 3 objectives.

As officers and representatives of \_\_\_\_\_ (Company),

We the undersigned have read and fully agree to the Section 3 Affirmative Action Plan, and become a party to the full implementation of the program and its provisions.

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Title

\_\_\_\_\_  
Date

\_\_\_\_\_  
Title

\_\_\_\_\_  
Date

**EXHIBIT E**

**Section 3 Clause**

All Section 3 covered contracts shall include the following clause (referred to as the Section 3 Clause):

- A. The work to be performed under this contract is subject to the requirements of Section 3 of the Housing and Urban Development Act of 1968, as amended, 12 U.S.C. 1701u (Section 3). The purpose of Section 3 is to ensure that employment and other economic opportunities generated by HUD assistance or HUD- assisted projects covered by Section 3, shall, to the greatest extent feasible, be directed to low-and very low-income persons, particularly person who are recipients of HUD assistance for housing.
- B. The parties to this contract agree to comply with HUD's regulations in 24 CFR Part 135, which implement Section 3. As evidenced by their execution of this contract, the parties to this contract certify that they are under no contractual or other impediment that would prevent them from complying with the part 135 regulations.
- C. The contractor agrees to send to each labor organization or representative or workers with which the contractor has a collective bargaining agreement or other understanding, if any a notice advising the labor organization or workers' representative of the contractor's commitments under the Section 3 clause, and will post copies of the notice in conspicuous places at the work site where both employees and applicants for training and employment positions can see the notice. The notice shall describe the Section 3 preference, shall set forth minimum number and job titles subject to hire, availability of apprenticeship and training positions, the qualifications for each; and the name and location of the person(s) taking applications for each of the positions; and the anticipated date the work shall begin.
- D. The contractor agrees to include this Section 3 clause in every subcontract subject to compliance with regulations in 24 CFR part 135, and agrees to take appropriate action, as provided in an applicable provision of the subcontract or in this Section 3 clause, upon a finding that the subcontractor is in violation of the regulations in 24 CFR part 135. The contractor will not subcontract with any subcontractor where the contractor has notice or knowledge that the subcontractor has been found in violation of the regulations in 24 CFR part 135.
- E. The contractor will certify that any vacant employment positions, including training positions, that are filled (1) after the contractor is selected but before the contract is executed, and (2) with persons other than those to whom the regulations of 24 CFR part 135 require employment opportunities to be directed, were not filled to circumvent the contractor's obligations under 24 CFR part 135.
- F. Noncompliance with HUD's regulations in 24 CFR part 135 may result in sanctions, termination of this contract for default, and debarment or suspension from future HUD assisted contracts.
- G. With respect to work performed in connection with Section 3 covered Indian housing assistance, section 7(b) of the Indian Self-Determination and Education Assistance Act. (25 U.S.C 450e) also applies to the work to be performed under this contract. Section 7(b) requires that to the greatest extent feasible (i) preference and opportunities for training and employment shall be give to Indians, and (ii) preference in the award of contracts and subcontracts shall be given to Indian organizations and Indian-owned Economic Enterprises. Parties to this contract that are subject to the provisions of Section 3 and section 7(b) agree to comply with Section 3 to the maximum extent feasible, but not in derogation of compliance with section 7(b).

**EXHIBIT F**  
**POSTED NOTICE TO PROJECT RESIDENTS**

The project \_\_\_\_\_  
is being funded by the U.S. Department of Housing and Urban Development under the \_\_\_\_\_ -  
Community Development Block Grant Program. This notice complies with the RGVECs \_\_\_\_\_  
Section 3 Plan and is intended to inform the public, in particular project residents, of the economic  
opportunities (jobs) created through the use of the federal award.

Contractor/subcontractor intends to hire for the following positions:

Number of Jobs	Title	Description of Qualifications/Licensure /Certification

Section 3 preferences:

1. Persons residing in the project area and who are of low- to very-low- income
2. Participants in HUD Youthbuild
3. Homeless Persons
4. Residents of the local Public Housing Authority
5. Residents of the local Section 8 Housing Assistance Program units

For more information including job applications, apprenticeships, training positions, and qualifications,  
contact:

Name of Contractor \_\_\_\_\_  
Contact Person \_\_\_\_\_  
Address \_\_\_\_\_  
City, State, Zip \_\_\_\_\_  
Phone \_\_\_\_\_

Estimated construction start date is \_\_\_\_\_

**EXHIBIT G  
ESTIMATED WORKFORCE BREAKDOWN**

**NAME OF BUSINESS/CONTRACTOR/SUBCONTRACTOR** \_\_\_\_\_

COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4	COLUMN 5
JOB CATEGORY	TOTAL ESTIMATE POSITIONS	NO. POSITIONS CURRENTLY OCCUPIED BY PERMANENT EMPLOYEES	NO. POSITIONS NOT CURRENTLY OCCUPIED	NO. POSITIONS TO BE FILLED WITH SECTION 3 RESIDENTS/LOW INCOME PERSONS *
OFFICERS SUPERVISORS				
PROFESSIONALS				
TECHNICIANS				
HOUSING SALES/RENTAL MANAGEMENT				
OFFICE CLERICAL				
SERVICE WORKERS				
OTHERS				

TRADE: Plumbing/Electrical/HVAC/Construction/Other: \_\_\_\_\_

JOURNEYMEN				
COMMON LABORERS				
APPRENTICES				
MAXIMUM NO. OF TRAINEES				

TRADE: Plumbing/Electrical/HVAC/Construction/Other: \_\_\_\_\_

JOURNEYMEN				
COMMON LABORERS				
APPRENTICES				
MAXIMUM NO. OF TRAINEES				

TRADE: Plumbing/Electrical/HVAC/Construction/Other: \_\_\_\_\_

JOURNEYMEN				
COMMON LABORERS				
APPRENTICES				
MAXIMUM NO. OF TRAINEES				

TRADE: Plumbing/Electrical/HVAC/Construction/Other: \_\_\_\_\_

JOURNEYMEN				
COMMON LABORERS				
APPRENTICES				
MAXIMUM NO. OF TRAINEES				

\* A Section 3 Resident is 1) a public housing resident; or 2) a low or very low income person residing in the metropolitan area or non – metropolitan county where the project is located.

**ALL NEW HIRES MUST COMPLETE AN INCOME DOCUMENTATION CERTIFICATION—SEE EXHIBITS K AND L.**

**EXHIBIT H**

**SECTION 3 MONTHLY COMPLIANCE FORM**

Contractor and all subcontractor(s) must sign, date and deliver this form monthly to:

RGVEC: \_\_\_\_\_ Project Name: \_\_\_\_\_

RGVEC Address: \_\_\_\_\_ Project Location: \_\_\_\_\_

For the Month of \_\_\_\_\_

**I. Hiring**

Select one:

I have not hired any new employees during the month specified.

I have hired \_\_\_\_\_ Section 3 employees and/or \_\_\_\_\_ non-Section 3 employees during the month.

**I. Recruitment**

I have taken one or more of the following recruitment steps to hire a Section 3 resident with the highest training and employment priority ranking: (check all that apply)

I have advertised to fill vacancy(ies) at the site(s), where work is taking place, in connection with this project. Below, I have checked the steps I have taken to find Section 3 low-income residents, from the targeted groups and neighborhoods, to fill any vacancies.

Placed signs or posters in prominent places at project site(s).

Taken photographs of the above item to document that the above step was carried out.

Distributed employment flyers to the administrative office of the local Public Housing Authority.

Contacted RGVECs employment referrals or Youthbuild Program referrals.

Kept a log of all applicants and indicated the reasons why Section 3 residents who applied were not hired.

Retained copies of any employment applications completed by Public Housing Authority, Section 8 certificate or voucher holders or other Section 3 residents.

Sent a notice about Section 3 training and employment requirements and opportunities to labor organizations or to worker representatives with whom our firm has a collective bargaining or other agreement.

**II. Verification**

I have attached proof of all checked items.

I hereby certify that the above information is a true and correct.

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Title

\_\_\_\_\_  
Date

\_\_\_\_\_  
Business Name

**EXHIBIT I**

**MONTHLY EMPLOYMENT UTILIZATION REPORT**

TO: City/County

FROM: \_\_\_\_\_

Hidalgo County Urban County Program

(Contractor)  
ADDRESS OF CONTRACTOR

NAME OF PROJECT: \_\_\_\_\_

\_\_\_\_\_ Street

Bid No. 2012-

\_\_\_\_\_ City, State

GRANT NUMBER:  
B-08 THRU B-12-MC-48-0504

CONTRACTOR'S PHONE NUMBER:  
\_\_\_\_\_ ( ) \_\_\_\_\_

REPORTING PERIOD: \_\_\_\_\_

PERCENTAGE OF PROJECT COMPLETION: \_\_\_\_\_

CLASSIFICATION	WORK HOURS OF EMPLOYMENT ON THIS PROJECT								
	TOTAL	BLACK	WHITE	ASIAN OR PACIFIC ISLANDER	HISPANIC	FEMALE	DISABLED	VETERAN	SECTION 3 RESIDENT
OFFICERS									
SUPERVISORS									
PROFESSIONALS									
TECHNICIANS									
HOUSING SALES/RENTAL MANAGEMENT									
OFFICE CLERICAL									
SERVICE WORKERS									
JOURNEYMEN									
COMMON LABORERS									
APPRENTICES									
TRAINEES									
<b>TOTAL</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

% OF MINORITY EMPLOYEES                      0 #DIV/0!  
 % FEMALE EMPLOYEES                              #DIV/0!  
 % LOW INCOME/SECTION 3 EMPLOYEES        #DIV/0!  
 % HANDICAPPED EMPLOYEES                    #DIV/0!

\_\_\_\_\_  
SIGNATURE AND TITLE OF COMPANY OFFICIAL COMPLETING REPORT

DATE SIGNED \_\_\_\_\_

This form must be completed monthly by the General Contractor for all workers



Rio Grande Valley Entitlement Communities Section 3 Plan  
**EXHIBIT J**

**SECTION 3 EMPLOYEE DATA & CERTIFICATION**

The U.S. Department of Housing and Urban Development (HUD) requires that the County/City of \_\_\_\_\_ document the income of newly hired persons working on federally-funded construction projects. This form is intended to comply with HUD Community Development Block Grant requirements.

Applicant's Name: \_\_\_\_\_ Job Title: \_\_\_\_\_

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

How many people are in your family? (Circle one) 1 2 3 4 5 6 7 8+

What is your family's gross annual income (before taxes)? \_\_\_\_\_

What is your race? (Circle one)

**WHITE**

**BLACK/AFRICAN AMERICAN**

**ASIAN**

**AMERICAN INDIAN/ALASKAN NATIVE**

**NATIVE HAWAIIAN/OTHER PACIFIC ISLANDER**

**ASIAN & WHITE**

**BLACK & WHITE**

**AM. INDIAN/ALASKAN NATIVE & BLACK**

**OTHER MULTIRACIAL**

Is your family of Hispanic origin? (Circle one) YES NO

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

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Employee's

**EXHIBIT K**

**SECTION 3 EMPLOYEE DATA & CERTIFICATION**

El Departamento de Vivienda y Desarrollo Urbano (HUD) requiere que la Ciudad de \_\_\_\_\_ obtenga documentos de ingresos de las personas nuevamente empleadas que trabajan en los proyectos que reciben beneficios de programas federales. Esta forma es requerida para cumplir con los requisitos de Subvención de Bloque de Desarrollo de Comunidad de HUD.

FAVOR DE ESCRIBIR A LETRA DE MOLDE

Seccion I

Nombre del Participante \_\_\_\_\_ Titulo de Trabajo \_\_\_\_\_

Direccion \_\_\_\_\_ Telefono \_\_\_\_\_

Seccion II

¿**Cuantos personas en su Familia ?** (Circule uno)

¿Cuál es dinero anual gruesa de su familia (antes de impuestos)? \_\_\_\_\_

¿Cuál es su raza? (Circule uno)

**AMERICANO**

**NEGRO/ AMERICANO AFRICANO**

**ASIÁTICO**

**INDIO AMERICANO/NATURAL DE ALASKA**

**NATURAL DE HAWAII/ EL OTRO ISLEÑO PACÍFICO**

**ASIÁTICO & AMERICANO**

**AMERICANO AFRICANO & AMERICANO**

**INDIA AMERICANO/NATURAL DE ALASKA & AMERICANO AFRICANO**

**EL OTRO MULTI-RACIAL**

¿Está su familia de origen hispanico?(Circule uno)      **Sí**                                      **No**

Certifico que toda la información antedicha está verdad y correcta al mejor de mi conocimiento.

\_\_\_\_\_  
Firma del Empleado

\_\_\_\_\_  
Fecha

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT  
**CERTIFICATION OF BIDDER REGARDING EQUAL EMPLOYMENT  
OPPORTUNITY INSTRUCTIONS**

This certification is required pursuant to Executive Order 11246 (30 F.R. 12319-25). The implementing rules and regulations provide that any bidder or prospective contractor, or any of their proposed subcontractors, shall state as an initial part of the bid or negotiations of the contract whether it has participated in any previous contract or subcontract subject to the equal opportunity clause; and, if so, whether it has filed all compliance reports due under applicable instructions.

Where the certification indicates that the bidder has not filed a compliance report due under applicable instructions, such bidder shall be required to submit a compliance report within seven calendar days after bid opening. No contract shall be awarded unless such report is submitted.

**CERTIFICATION BIDDER**

NAME AND ADDRESS OF BIDDER *(Includes ZIP Code)*

1. Bidder has participated in a previous contract or subcontract subject to the Equal Opportunity Clauses.

Yes       No

2. Compliance reports were required to be filed in connection with such contract or subcontract.

Yes       No

3. Bidder has filed all compliance reports due under applicable instructions, including SF-100.

Yes       No       None Required

4. Have you ever been or are you being considered for sanction due to violation of Executive Order 11246, as amended?

Yes       No

NAME AND TITLE OF SIGNER *(Please type):*

SIGNATURE

DATE

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT <b>CERTIFICATION BY PROPOSED SUBCONTRACTOR REGARDING EQUAL                      EMPLOYMENT OPPORTUNITY INSTRUCTIONS</b>	
This certification is required pursuant to Executive Order 11246 (30 F.R. 12319-25). The implementing rules and regulations provide that any bidder or prospective contractor, or any of their proposed subcontractors, shall state as an initial part of the bid or negotiations of the contract whether it has participated in any previous contract or subcontract subject to the equal opportunity clause; and, if so, whether it has filed all compliance reports due under applicable instructions.	
Where the certification indicates that the bidder has not filed a compliance report due under applicable instructions, such bidder shall be required to submit a compliance report within seven calendar days after bid opening. No contract shall be awarded unless such report is submitted.	
<b>SUBCONTRACTOR'S CERTIFICATION</b>	
NAME AND ADDRESS OF BIDDER <i>(Includes ZIP Code)</i>	
1. Bidder has participated in a previous contract or subcontract subject to the Equal Opportunity Clauses. <div style="display: flex; justify-content: space-around; margin-left: 100px;"> <input type="checkbox"/> Yes                             <input type="checkbox"/> No                         </div>	
2. Compliance reports were required to be filed in connection with such contract or subcontract. <div style="display: flex; justify-content: space-around; margin-left: 100px;"> <input type="checkbox"/> Yes                             <input type="checkbox"/> No                         </div>	
3. Bidder has filed all compliance reports due under applicable instructions, including SF-100. <div style="display: flex; justify-content: space-around; margin-left: 100px;"> <input type="checkbox"/> Yes                             <input type="checkbox"/> No                             <input type="checkbox"/> None Required                         </div>	
4. Have you ever been or are you being considered for sanction due to violation of Executive Order 11246, as amended? <div style="display: flex; justify-content: space-around; margin-left: 100px;"> <input type="checkbox"/> Yes                             <input type="checkbox"/> No                         </div>	
NAME AND TITLE OF SIGNER <i>(Please type)</i>	
SIGNATURE	DATE

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT  
COMMUNITY DEVELOPMENT BLOCK GRANT PROGRAM  
**CONTRACTOR'S CERTIFICATION**  
**CONCERNING LABOR STANDARDS AND PREVAILING WAGE REQUIREMENTS**

TO (Appropriate Recipient):	PROJECT NUMBER (If any) DATE
c/o	PROJECT NAME

1. The undersigned, having executed a contract with \_\_\_\_\_  
\_\_\_\_\_ for the construction of the above  
identified project, acknowledges that :
  - (a) The Labor Standards provisions are included in the aforesaid contract;
  - (b) Correction of any infractions of the aforesaid conditions, including infractions by any of his subcontractors and any lower tier subcontractors, is his responsibility;
  
2. He certifies that:
  - (a) Neither he nor any firm, partnership or association in which he has substantial \_\_\_\_\_ interest is designated as an ineligible contractor by the Comptroller General of the United States pursuant to Section 5.6(b) of the Regulations of the Secretary of Labor, Part 5 (29 CFR, Part 5) or pursuant to Section 3(a) of the Davis-Bacon Act, as amended (40 U.S.C. 276a-2(a)).
  - (b) No part of the aforementioned contract has been or will be subcontracted to any subcontractor if sub subcontractor or any firm, corporation, partnership or association in which such subcontractor has a substantial interest is designated as an ineligible contractor pursuant to any of the aforementioned regulatory or statutory provisions.
  
3. He agrees to obtain and forward to the aforementioned recipient within ten days after the execution of any subcontract, including those executed by his subcontractors and any lower tier subcontractors, a Subcontractor's Certification Concerning Labor Standards and Prevailing Wage Requirements executed by the subcontractors.
  
4. He certifies that:
  - (a) The legal name and the business address of the undersigned are:

---

(b) The undersigned is:

(1) A SINGLE PROPRIETORSHIP	(3) A CORPORATION ORGANIZED IN THE STATE OF
(2) A PARTNERSHIP	(4) OTHER ORGANIZATION (Describe)

(c) The name, title and address of the owner, partners or officers of the undersigned are:

NAME	TITLE	ADDRESS

(d) The names and addresses of all other persons, both natural and corporate, having a substantial interest in the undersigned, and the nature of the interest are *(if none, so state)*

NAME	ADDRESS	NATURE OF INTEREST

(e) The names, addresses and trade classifications of all other building construction contractors in which the undersigned has a substantial interest are *(if none, so state)*

NAME	ADDRESS	TRADE CLASSIFICATION

*(Contractor)*

By \_\_\_\_\_  
*(Signature)*

\_\_\_\_\_ *(Typed Name and Title)*

Title \_\_\_\_\_

Date \_\_\_\_\_

**WARNING**

U.S. Criminal Code, Section 1010, Title 18, U.S.C., provides in part: "Whoever,....makes, passes, utters or publishes any statement, knowing the same to be false..... shall be fined not more that \$ 5,000 or imprisoned not more than two years, or both."

**U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT  
COMMUNITY DEVELOPMENT BLOCK GRANT PROGRAM  
SUBCONTRACTOR'S CERTIFICATION  
CONCERNING LABOR STANDARDS AND PREVAILING WAGE REQUIREMENTS**

TO <i>(Appropriate Recipient)</i> :	PROJECT NUMBER <i>(If any)</i> DATE
c/o	PROJECT NAME

1. The undersigned, having executed a contract with \_\_\_\_\_  
(Contractor or Subcontractor)

for \_\_\_\_\_ in the amount of \$ \_\_\_\_\_  
(Nature of work)

in the construction of the above-identified project, certifies that:

- (a) The Labor Standards Provisions of the Contract for Construction are included in the aforesaid contract.
- (b) Neither he nor any firm, corporation, partnership or association in which he has a substantial interest is designated as an ineligible contractor by the Comptroller General of the United States pursuant to Section 5.6(b) of the Regulations of the Secretary of Labor, Part 5 (29 CFR, Part 5), or pursuant to Section 3(a) of the Davis-Bacon Act, as amended (10 U.S.C. 276a-2(a)).
- (c) No part of the aforementioned contract has been or will be subcontracted to any subcontractor if such subcontractor or any firm, corporation, partnership or association in which such subcontractor has a substantial interest is designated as an ineligible contractor pursuant to the aforesaid regulatory or statutory provisions.

2. He agrees to obtain and forward to the contractor, for transmittal to the recipient, within ten days after the execution of any lower subcontract, a Subcontractor's Certification Concerning Labor Standards and Prevailing Wage requirements, executed by the lower tier subcontractor, in duplicate.

(a) The workmen will report for duty on or about: \_\_\_\_\_  
(Date)

3. He certifies that:

(a) The legal name and the business address of the undersigned are:

\_\_\_\_\_

(b) The undersigned is:

(1) A SINGLE PROPRIETORSHIP	(3) A CORPORATION ORGANIZED IN THE STATE OF
(2) A PARTNERSHIP	(4) OTHER ORGANIZATION (Describe)

(c) The name, title and address of the owner, partners or officers of the undersigned are:

NAME	TITLE	ADDRESS

(d) The names and addresses of all other persons, both natural and corporate, having a substantial interest in the undersigned, and the nature of the interest are *(if none, so state)*

NAME	ADDRESS	NATURE OF INTEREST

(e) The names, addresses and trade classifications of all other building construction contractors in which the undersigned has a substantial interest are *(if none, so state)*

NAME	ADDRESS	TRADE CLASSIFICATION

*(Subcontractor)*

By \_\_\_\_\_  
*(Signature)*

\_\_\_\_\_ *(Typed Name and Title)*

Title \_\_\_\_\_

Date \_\_\_\_\_

**WARNING**

U.S. Criminal Code, Section 1010, Title 18, U.S.C., provides in part: "Whoever,.....makes, passes, utters or publishes any statement, knowing the same to be false..... shall be fined not more that \$ 5,000 or imprisoned not more than two years, or both."



**HIDALGO URBAN COUNTY PROGRAM  
CERTIFICATE FROM CONTRACTOR/SUBCONTRACTOR APPOINTING  
OFFICER OR EMPLOYEE TO SUPERVISE PAYMENT OF EMPLOYEES**

Contractor Name: \_\_\_\_\_ Date: \_\_\_\_\_

Location: \_\_\_\_\_

Contract No.: \_\_\_\_\_

(I) (We) do hereby certify that (I am) (we are) (the prime contractor) (a subcontractor) for \_\_\_\_\_ in connection with construction of the above-mentioned Project, and that (I) (We) have appointed, \_\_\_\_\_, whose signature appears below, to supervise the payment of (my) (our) employees beginning \_\_\_\_\_, 20\_\_\_\_\_; that he/she in a position to have a full knowledge of the facts set forth in the payroll documents and in the statement of compliance required by the so-called Kick-Back Statute which he/she is to execute with (my) (our) full authority and approval until such time as (I) (We) submit to the Urban County Program a new certificate appointing some other person for the purposes herein above stated.

\_\_\_\_\_  
(Identifying Signature of Appointee)

Attest (if required): \_\_\_\_\_  
(Name of Firm and Corporation)

\_\_\_\_\_  
By: \_\_\_\_\_

\_\_\_\_\_  
(Title)

\_\_\_\_\_  
(Title)

NOTE: This certificate must be executed by an authorized officer or a corporation, by a member of a partnership, or the sole owner and shall be executed prior to and be submitted with the first payroll. Should the appointee be changed, a new certificate must accompany the first payroll for which the new appointee executes a statement of compliance required by the Anti kickback Statute.

## PAYMENT BOND

A payment bond as described by Texas Government Code, Section 2253.021 (c) for the beneficiaries described by such sub section.

KNOW ALL MEN BY THESE PRESENTS, that \_\_\_\_\_  
(hereinafter called the Principal(s)), as Principal(s), and \_\_\_\_\_  
(hereafter called the Surety(s)), as Surety(s), are held and firmly bound unto  
\_\_\_\_\_ (hereinafter called the Oblige), in the amount of  
\_\_\_\_\_ Dollars (\$ \_\_\_\_\_) for the payment whereof, the said Payment and  
Surety bind themselves, and their heirs, administrators, executors, successors and assigns, jointly  
and severally, firmly by these presents.

WHEREAS, the Principal has entered into a certain written contract with the Oblige, dated  
the \_\_\_ day of \_\_\_\_\_, 20\_\_\_, for the \_\_\_\_\_ which contract is  
hereby referred to and made a part hereof as fully and to the same extent as if copies at length  
herein.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH, that if the said  
Principal shall pay all claimants supplying labor and material to him or a subcontractor in the  
prosecution of the work provided for in said contract, then, this, obligation shall be void;  
otherwise to remain in full force and effect.

**PAYMENT BOND CONTINUED:**

IN WITNESS WHEREOF, this instrument is executed in four counter parts, each one of which shall be deemed an original, this the \_\_\_\_\_ day of \_\_\_\_\_, A.D., 20\_\_.

ATTEST:

\_\_\_\_\_  
PRINCIPAL

\_\_\_\_\_  
(Principal) Secretary  
(Seal)

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Witness as to Principal

\_\_\_\_\_  
Print/Type Name

\_\_\_\_\_  
Address

\_\_\_\_\_  
Address

ATTEST:

\_\_\_\_\_  
Surety

\_\_\_\_\_  
(Surety) Secretary  
(Seal)

\_\_\_\_\_  
Attorney-in-Fact (Signature)

\_\_\_\_\_  
Witness as to Surety

\_\_\_\_\_  
Print/Type Name

\_\_\_\_\_  
Address

\_\_\_\_\_  
Address

Note: Date of Bond must be prior to date of Contract

(1) Correct Name of Contractor; (2) A Corporation, A Partnership or an individual, as case may be; (3) Correct Name of Surety; (4) Correct name of Owner; (5) County or Parish and State; (6) Owner; (7) if Contractor is Partnership, all partners should execute Bond.

**PERFORMANCE BOND**

A performance bond as described by Texas Government Code, Section 2253.021 (b) for the benefit of Hidalgo County-Urban County Program:

KNOW ALL MEN BY THESE PRESENTS, that \_\_\_\_\_  
\_\_\_\_\_ (hereinafter called the Principal(s), as Principal (s),  
and \_\_\_\_\_ hereinafter call the Surety(s), as  
Surety(s), are held and firmly bound unto \_\_\_\_\_ (hereinafter  
called the Oblige), in the amount of \_\_\_\_\_ Dollars (\$\_\_\_\_\_) )  
for the payment whereof, the said Principal and Surety bind themselves, and their heirs,  
administrators, executors, successors and assigns, jointly and severally, firmly by these  
presents.

WHEREAS, the Principal has entered into a certain written contract with the Oblige,  
dated the \_\_\_\_ day of \_\_\_\_\_, 20\_\_, for the \_\_\_\_\_  
\_\_\_\_\_ which contract is hereby referred to and made a part hereof as  
fully and to the same extent as if copies at length herein.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH, that if the  
said Principal shall faithfully perform the work in accordance with the plans,  
specifications and contract documents, then this obligation shall be void; otherwise to  
remain in full force and effect.

IN WITNESS WHEREOF, this instrument is executed in four counter parts, each one of  
which shall be deemed an original, this the \_\_\_\_\_ day of \_\_\_\_\_, A.D.,  
20\_\_\_\_\_.

ATTEST:

\_\_\_\_\_  
PRINCIPAL

\_\_\_\_\_  
(Principal) Secretary  
(Seal)

\_\_\_\_\_  
Signature

PERFORMANCE BOND CONTINUED:

\_\_\_\_\_  
Witness as to Principal

\_\_\_\_\_  
Address

ATTEST:

\_\_\_\_\_  
(Surety Secretary

\_\_\_\_\_  
Witness as to Surety

\_\_\_\_\_  
Address

\_\_\_\_\_  
Print/Type Name

\_\_\_\_\_  
Address

\_\_\_\_\_  
Surety

\_\_\_\_\_  
Attorney-in-Fact (Signature)

\_\_\_\_\_  
Print/Type Name

\_\_\_\_\_  
Address

Note: Date of Bond must be prior to date of Contract

(1) Correct Name of Contractor; (2) A Corporation, A Partnership or an individual, as case may be; (3) Correct Name of Surety; (4) Correct name of Owner; (5) County or Parish and State; (6) Owner; (7) if Contractor is Partnership, all partners should execute Bond.

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**U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT  
COMMUNITY DEVELOPMENT BLOCK  
GRANT PROGRAM**

**GENERAL CONDITIONS**

**1. Contract and Contract Documents**

The project to be constructed pursuant to this contract will be financed with assistance from the Department of Housing and Urban Development and is subject to all applicable Federal laws and regulations.

The Plans, Specifications and Addenda, hereinafter enumerated in paragraph 1 of the Supplemental General Conditions shall form part of this Contract and the provisions thereof shall be as binding upon the parties hereto as if they were herein fully set forth. The table of contents, titles, headings, running headlines and marginal notes contained herein and in said documents are solely to facilitate reference to various provisions of the Contract Documents and in no way affect, limit or cast light on the interpretation of the provisions to which they refer.

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**2. Definitions**

The following terms as used in this contract are respectively defined as follows:

- (a) "Contractor": A person, firm or corporation with whom the contract is made by the Owner.
- (b) "Subcontractor": A person, firm or corporation supplying labor and materials or only labor for work at the site of the project for, and under separate contract or agreement with, the Contractor.
- (c) "Work on (at) the project": Work to be performed at the location of the project, including the transportation of materials and supplies to or from the location of the project by employees of the Contractor and any Subcontractor.

**3. Additional Instructions and Detail Drawings**

The Contractor will be furnished additional instructions and detail drawings as necessary to carry out the work included in the contract. The additional drawings and instructions thus supplied to the Contractor will coordinate with the Contract Documents and will be so prepared that they can be reasonably interpreted as part thereof. The Contractor shall carry out the work in accordance with the additional detail drawings and instructions. The Contractor and the Architect/Engineer will prepare jointly (a) a schedule, fixing the dates at which special detail drawings will be required, such drawings, if any, to be furnished by the Architect/Engineer in accordance with said schedule, and (b) a schedule fixing the respective dates for the submission of shop drawings, the beginning of manufacture, testing and installation of materials, supplies and equipment, and the completion of the various parts of the work: each such schedule to be subject to change from time to time in accordance with the progress of the work.

**4. Shop or Setting Drawings**

The Contractor shall submit promptly to the Architect/Engineer two copies of each shop or setting drawing prepared in accordance with the schedule predetermined as aforesaid. After examination of such drawings by the Architect/Engineer and the return thereof, the Contractor shall make such corrections to the drawings as have been indicated and shall furnish the Architect/Engineer with two corrected copies. If requested by the Architect/Engineer the Contractor must furnish additional copies. Regardless of corrections made in or approval given to such drawings by the Architect/Engineer, the Contractor will nevertheless be responsible for the accuracy of such drawings and for their conformity to the Plans and Specifications, unless he notifies the Architect/Engineer in writing of any deviations at the time he furnishes such drawings.

**5. Materials, Services, and Facilities**

- (a) It is understood that except as otherwise specifically stated in the Contract Documents, the Contractor shall provide and pay for all materials, labor, tools, equipment, water, light, power, transportation, superintendence, temporary



construction of every nature, and all other services and facilities of every nature whatsoever necessary to execute, complete and deliver the work within the specified time.

- (b) Any work necessary to be performed after regular working hours, on Sunday or Legal Holidays, shall be performed without additional expense to the Owner.

**6. Contractor's Title to Materials**

No materials or supplies for the work shall be purchased by the Contractor or by any Subcontractor subject to any chattel mortgage or under a conditional sale contract or other agreement by which any interest is retained by the seller. The Contractor warrants that he has good title to all materials and supplies used by him in the work, free from all liens, claims or encumbrances.

**7. Inspection and Testing of Materials**

- (a) All materials and equipment used in the construction of the project shall be subject to adequate inspection and testing in accordance with accepted standards. The laboratory or inspection agency shall be selected by the Owner. The owner will pay for all laboratory inspection service direct, and not as a part of the contract.
- (b) Materials of construction, particularly those upon which the strength and durability of the structure may depend, shall be subject to inspection and testing to established conformance with specifications and suitability for uses intended.

**8. "Or Equal" Clause**

Whenever a materials, article or piece of equipment is identified on the plans or in the specifications by reference to manufacturers' or vendors' names, trade names, catalogue numbers, etc., it is intended merely to establish a standard; and, any materials, article, or equipment of other manufacturers and vendors which will perform adequately the duties imposed by the general design will be considered equally acceptable provided the material, article, or equipment so proposed, is, in the opinion of the Architect/Engineer, of equal substance and function. It shall not be purchased or installed by the contractor without the Architect/Engineer's written approval.

**9. Patents**

- (a) The Contractor shall hold and save the Owner and its officers, agents, servants, and employees harmless from liability of any nature or kind, including cost and expenses for, or on account of, any patented or unpatented invention, process, article, or appliance manufactured or used in the performance of the contract, including its use by the Owner, unless otherwise specifically stipulated in the Contract Documents.
- (b) License or Royalty Fees: License and/or Royalty Fees for the use of a process which is authorized by the Owner of the project must be reasonable, and paid to the holder of the patent, or his authorized licensee, direct by the Owner and not by or through the Contractor.

(c) If the Contractor uses any design, device or materials covered by letters, patent or copyright, he shall provide for such use by suitable agreement with the Owner of such patented or copyrighted design, device or material. It is mutually agreed and understood, that, without exception, the contract prices shall include all royalties or costs arising from the use of such design, device or materials, in any way involved in the work. The Contractor and/or Owner of the project from any and all claims for infringement by reason of the use of such patented or copyrighted design, device or materials or any trademark or copyright in connection with work agrees to be performed under this contract, and shall indemnify the Owner for any cost, expense or damage which it may be obligated to pay by reason of such infringement at any time during the prosecution of the work or after completion of the work.

#### **10. Surveys, Permits, and Regulations**

Unless otherwise expressly provided for in the Specifications, the Owner will furnish to the Contractor all surveys necessary for the execution of the work.

The Contractor shall procure and pay all permits, licenses and approvals necessary for the execution of the work.

The Contractor shall comply with all laws, ordinances, rules, orders, and regulations relating to performance of the work, the protection of adjacent property, and the maintenance of passageways, guard fences or other protective facilities.

#### **11. Contractor's Obligations**

The Contractor shall and will, in good workmanlike manner, do and perform all work and furnish all supplies and materials, machinery, equipment, facilities and means, except as herein otherwise expressly specified, necessary or proper to perform and complete all the work required by this contract, within the time herein specified, in accordance with the provisions of this contract and said specifications and in accordance with the plans and drawings covered by this contract any and all supplemental plans and drawings, and in accordance with the directions of the Architect/Engineer as given from time to time during the progress of the work. He shall furnish, erect, maintain, and remove such construction plant and such temporary works as may be required.

The Contractor shall observe, comply with, and be subject to all terms, conditions, requirements, and limitations of the contract and specifications, and shall do, carry on, and complete the entire work to the satisfaction of the Architect/Engineer and the Owner.

#### **12. Weather Conditions**

In the event of temporary suspension of work, or during inclement weather, or whenever the Architect/Engineer shall direct, the Contractor will, and will cause his subcontractors to protect carefully his and their work and materials against damage or injury from the weather. If, in the opinion of the Architect/Engineer, any work or materials shall have been damaged or injured by reason of failure on

the part of the Contractor or any of his Subcontractors so to protect his work, such materials shall be removed and replaced at the expense of the Contractor.

**13. Protection of Work and Property --Emergency**

The Contractor shall at all times safely guard the owner's property from injury or loss in connection with this contract. He shall at all times safely guard and protect his own work, and that of adjacent property from damage. The Contractor shall replace or make good any such damage, loss or injury unless such be caused directly by errors contained in the contract or by the Owner, or his duly authorized representatives.

In case of an emergency which threatens loss or injury of property, and/or safety of life, the Contractor will be allowed to act, without previous instructions from the Architect/Engineer, in a diligent manner. He shall notify the Architect/Engineer immediately thereafter. Any claim for compensation by the Contractor due to such extra work shall be promptly submitted to the Architect/Engineer for approval.

Where the Contractor has not taken action but has notified the Architect/Engineer of an emergency threatening injury to persons or damage to the work or any adjoining property, he shall act as instructed or authorized by the Architect/Engineer.

The amount of reimbursement claimed by the Contractor on account of any emergency action shall be determined in the manner provided in Paragraph 17 of the General Conditions.

**14. Inspection**

The authorized representatives and agents of the Department of Housing and Urban Development shall be permitted to inspect all work, materials, payrolls, records of personnel, invoices of materials, and other relevant data and records.

**15. Reports, Records, and Data**

The Contractor shall submit to the Owner such schedule of quantities and costs, progress schedules, payrolls, reports, estimates, records and other data as the Owner may request concerning work performed or to be performed under this contract.

**16. Superintendence by Contractor**

At the site of the work the Contractor shall employ a construction superintendent or foreman who shall have full authority to act for the Contractor. It is understood that such representative shall be acceptable to the Architect/Engineer and shall be one who can be continued in that capacity for the particular job involved unless he ceases to be on Contractor's payroll.

**17. Changes in Work**

No changes in the work covered by the approved Contract Documents shall be made without having prior written approval of the Owner. Charges or credits for the work covered by the approved change shall be determined by one or more, or a combination of the following methods:

- (a) Unit bid prices previously approved.
- (b) An agreed lump sum,
- (c) The actual cost of:
  - 1. Labor, including foremen;
  - 2. Materials entering permanently into the work;
  - 3. The ownership or rental cost of construction plant and equipment during the time of use on the extra work;
  - 4. Power and consumable supplies for the operation of power equipment;
  - 5. Insurance;
  - 6. Social Security and old age and unemployment contributions.

To the cost under (c) there shall be added a fixed fee to be agreed upon but not to exceed fifteen percent (15%) of the actual cost of the work. The fee shall be compensation to cover the cost of supervision, overhead, bond, profit and any other general expenses.

**18. Extras**

Without invalidating the contract, the Owner may order extra work or make changes by altering, adding to or deducting from the work, the contract sum being adjusted accordingly, and the consent of the Surety being first obtained where necessary or desirable. All work of the kind bid upon shall be paid for at the price stipulated in the proposal, and no claims for any extra work or materials shall be allowed unless the work is ordered in writing by the Owner or its Architect/Engineer, acting officially for the Owner, and the price is stated in such order.

**19. Time for Completion and Liquidated Damages**

It is hereby understood and mutually agreed, by and between the Contractor and the Owner that the date of beginning and the time for completion as specified in the contract of the work to be done hereunder are ESSENTIAL CONDITIONS of this contract; and it is further mutually understood and agreed that the work embraced in this contract shall be commenced on a date to be specified in the "Notice to Proceed."

The Contractor agrees that said work shall be prosecuted regularly, diligently, and uninterruptedly at such rate of progress as will insure full completion thereof within the time specified. It is expressly understood and agreed, by and between the Contractor and the Owner, that the time for the completion of the work described herein is a reasonable time for the completion of the same, taking into consideration the average climatic range and usual industrial conditions prevailing in this locality.

If the said Contractor shall neglect, fail or refuse to complete the work within the time herein specified, or any proper extension thereof granted by the owner, then the Contractor does hereby agree, as a part consideration for the awarding of this contract, to pay to the Owner the amount specified in the contract, not as a penalty but as liquidated damages for such breach of contract as hereinafter set forth, hereinafter set forth, for each and every calendar day that the Contractor shall be in default after the time stipulated in the contract for completing the work.

The said amount is fixed and agreed upon by and between the Contractor and the Owner because of the impracticability and extreme difficulty of fixing and ascertaining the actual damages the Owner would in such event sustain, and said amount is agreed to be the amount of damages which the Owner would sustain and said amount shall be retained for time to time by the Owner from current periodical estimates.

It is further agreed that time is of the essence of each and every portion of this contract and of the specifications wherein a definite and certain length of time is fixed for the performance of any act whatsoever; and where under the contract an additional time is allowed for the completion of any work, the new limit fixed by such extension shall be of the essence of this contract. Provided, that the Contractor shall not be charged with liquidated damages or any excess cost when the owner determines that the Contractor is without fault and the Contractor's reasons for the time extension are acceptable to the Owner; Provided, further, that the Contractor shall not be charged with liquidated damages or any excess cost when the delay in completion of the work is due:

- (a) To any preference, priority or allocation order duly issued by the Government;
- (b) To unforeseeable cause beyond the control and without the fault or negligence of the Contractor, including, but not restricted to, acts of God, or of the public enemy, acts of the Owner, acts of another Contractor in the performance of a contract with the Owner, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, and severe weather; and
- (c) To any delays of Subcontractors or suppliers occasioned by any of the causes specified in subsections (a) and (b) of this article;

Provided, further, that the Contractor shall, within ten (10) days from the beginning of such delay, unless the Owner shall grant a further period of time prior to the date of final settlement of the contract, notify the Owner, in writing, of the causes of the delay, who shall ascertain the facts and extent of the delay and notify the Contractor within a reasonable time of its decision in the matter.

## **20. Correction of Work**

All work, all materials, whether incorporated in the work or not, all processes of manufacture, and all methods of construction shall be at all times and places subject to the inspection of the Architect/Engineer who shall be the final judge of the quality and suitability of the work, materials, processes of manufacture, and methods of construction for the purposes for which they are used. Should they fail to meet his approval they shall be forthwith reconstructed, made good, replaced and/or corrected, as the case may be, by the Contractor at his own

expense. Rejected material shall immediately be removed from the site. If, in the opinion of the Architect/Engineer, it is undesirable to replace any defective or damaged materials or to reconstruct or correct any portion of the work injured or not performed in accordance with the Contract Documents, the compensation to be paid to the Contractor hereunder shall be reduced by such amount as in the judgment of the Architect/Engineer shall be equitable.

**21. Subsurface Conditions Found Different**

Should the Contractor encounter sub-surface and/or latent conditions at the site materially differing from those shown on the Plans or indicated in the Specifications, he shall immediately give notice to the Architect/Engineer of such conditions before they are disturbed. The Architect/Engineer will thereupon promptly investigate the conditions, and if he finds that they materially differ from those shown on the Plans or indicated in the Specifications, he will at once make such changes in the plans and/or Specifications as he may find necessary, any increase or decrease of cost resulting from such changes to be adjusted in the manner provided in paragraph 17 of the General Conditions.

**22. Claims for Extra Cost**

No claim for extra work or cost shall be allowed unless the same was done in pursuance of a written order of the Architect/Engineer approved by the Owner, as aforesaid, and the claim presented with the first estimate after the changed or extra work is done. When work is performed under the terms of subparagraph 17(c) of the General Conditions, the Contractor shall furnish satisfactory bills, payrolls and vouchers covering all items of cost and when requested by the Owner, give the Owner access to accounts relating thereto.

**23. Right of the Owner to Terminate Contract**

In the event that any of provisions of this contract are violated by the Contractor, or by any of his subcontractors, the Owner may serve written notice upon the Contractor and the Surety of its intention to terminate the contract, such notices to contain the reasons for such intention to terminate the contract, and unless within ten (10) days after the serving of such notice upon the Contractor, such violation or delay shall cease and satisfactory arrangement of correction be made, the contract shall, upon the expiration of said then (10) days, cease and terminate. In the event of any such termination, the Owner shall immediately serve notice thereof upon the Surety and the Contractor and the Surety shall have the right to take over and perform the contract; Provided, however, that if the Surety does not commence performance thereof within ten (10) days from the date of the mailing to such Surety of notice of termination, the Owner may take over the work and prosecute the same to completion by contract or by force account for the account and at the expense of the Contractor and the Contractor and his Surety shall be liable to the Owner for any excess cost occasioned the Owner thereby, and in such event the Owner may take possession of and utilize in completing the work, such materials, appliances, and plant as may be on the site of the work and necessary therefore.

## 24. Construction Schedule and Periodic Estimates

Immediately after execution and delivery of the contract, and before the first partial payment is made, the Contractor shall deliver to the Owner an estimated construction progress schedule in form satisfactory to the Owner, showing the proposed dates of commencement and completion of each of the various subdivisions of work required under the Contract Documents and the anticipated amount of each monthly payment that will become due the Contractor in accordance with the progress schedule. The Contractor shall also furnish on forms to be supplied by the Owner (a) a detailed estimate giving a complete breakdown of the contract price and (b) periodic itemized estimates of work done for the purpose of making partial payments thereon. The costs employed in making up any of these schedules will be used only for determining the basis of partial payments and will not be considered as fixing a basis for additions to or deductions from the contract price.

## 25. Payments to Contractor

- (a) Not later than the 15th day of each calendar month the Owner shall make a progress payment to the Contractor on the basis of a duly certified and approved estimate of the work performed during the preceding calendar month under this contract, but to insure the proper performance of this contract, the Owner shall retain ten percent (10%) of the amount of each estimate until final completion and acceptance of all work covered by this contract: Provided, that the Contractor shall submit his estimate not later than the first day of the month; Provided, further, that the Owner at any time after fifty percent (50%) of the work has been completed, if it finds that satisfactory progress is being made, may make any of the remaining progress payments in full; Provided, further, that on completion and acceptance of each separate building, public work, or other division of the contract, on which the price is stated separately in the contract, payment may be made in full, including retained percentages thereon, less authorized deductions.
- (b) In preparing estimates the material delivered on the site and preparatory work done may be taken into consideration.
- (c) All material and work covered by partial payments made shall thereupon become the sole property of the Owner, but this provision shall not be construed as relieving the Contractor from the sole responsibility for the care and protection of material and work upon which payments have been made or the restoration of any damaged work, or as a waiver of the right of the Owner to require the fulfillment of all of the terms of the contract.
- (d) Owner's Right to Withhold Certain Amounts and Make Application Thereof: The Contractor agrees that he will indemnify and save the Owner harmless from all claims growing out of the lawful demands of subcontractors, laborers, workmen, mechanics, materialmen, and furnisher of machinery and parts thereof, equipment, power tools, and all supplies, including commissary, incurred in the furtherance of the performance of this contract. The Contractor shall at the Owner's request, furnish satisfactory evidence that all obligations of the nature hereinabove designated have been paid, discharged, or waived. If the Contractor fails so to do, then the Owner may, after having served written notice on the said Contractor, either pay unpaid bills, of which

the Owner has written notice, direct, or withhold from the Contractor's unpaid compensation a sum of money deemed reasonably sufficient to pay any and all such lawful claims until satisfactory evidence is furnished that all liabilities have been fully discharged whereupon payment to the Contractor shall be resumed, in accordance with the terms of this contract, but in no event shall be provisions of this sentence be construed to impose any obligations upon the Owner to either the Contractor or his Surety. In paying any unpaid bills of the Contractor, the Owner shall be deemed the agent of the Contractor, and any payment so made by the Owner shall be considered as a payment made under the contract by the Owner to the Contractor and the Owner shall not be liable to the Contractor for any such payments made in good faith.

**26. Acceptance of Final Payment Constitutes Release**

The acceptance by the Contractor of final payment shall be and shall operate as a release to the Owner of all claims and all liability to the Contractor for all things done or furnished in connection with this work and for every act and neglect of the Owner and others relating to or arising out of this work. No payment, however, final or otherwise, shall operate to release the Contractor or his sureties from any obligations under this contract or the Performance and Payment bond.

**27. Payments by Contractor**

The Contractor shall pay (a) for all transportation and utility services not later than the 20th day of the calendar month following that in which services are rendered, (b) for all materials, tools, and other expendable equipment to the extent of ninety percent (90%) of the cost thereof, not later than the 20th day of the calendar month following that in which such materials, tools, and equipment are delivered at the site of the project, and the balance of the cost thereof, not later than the 30th day following the completion of that part of the work in or on which such materials, tools, and equipment are incorporated or used, and (c) to each of his subcontractors, not later than the 5th day following each payment to the Contractor, the respective amounts allowed the Contractor on account of the work performed by his subcontractors to the extent of each subcontractor's interest therein.

**28. Insurance**

The Contractor shall not commence work under this contract until he has obtained all the insurance required under this paragraph and such insurance has been approved by the Owner, nor shall the Contractor allow any subcontractor to commence work on his subcontract until the insurance required of the subcontractor has been so obtained and approved.

(a) Compensation Insurance: The Contractor shall procure and shall maintain during the life of the contract Workmen's Compensation Insurance as required by applicable State or territorial law for all of his employees to be engaged in work at the site of the project under this contract and, in case of any such work sublet, the Contractor shall require the subcontractor similarity to provide Workmen's Compensation Insurance for all of the latter's employees to be engaged in such work unless such employees are covered



by the protection afforded by the Contractor's Workmen's Compensation Insurance. In case any class of employees engaged in hazardous work on the project under this contract is not protected under the Workmen's Compensation Statute, the Contractor shall provide and shall cause each subcontractor to provide adequate employer's liability insurance for the protection of such of his employees as are not otherwise protected.

- (b) Contractor's Public Liability and property Damage Insurance and Vehicle Liability Insurance: The Contractor shall procure and shall maintain during the life of this contract Contractor's Public Liability Insurance, Contractor's Property Damage Insurance and Vehicle Liability Insurance in the amounts specified in the Supplemental General Conditions.
- (c) Subcontractor's Public Liability and Property Damage Insurance and Vehicle Liability Insurance: The Contractor shall procure and shall maintain during the life of this contract Contractor's Public Liability Insurance, Contractor's Property Damage Insurance and Vehicle Liability Insurance in the amounts specified in the Supplemental General Conditions.
- (d) Scope of Insurance and Special Hazards: The insurance required under subparagraphs (b) and (c) hereof shall provide adequate protection for the Contractor and his subcontractors, respectively, against damage claims which may arise from operations under this contract, whether such operations be by the insured or by anyone directly or indirectly employed by him and, also against any of the special hazards which may be encountered in the performance of this contract as enumerated in the Supplemental General Conditions.
- (e) Builder's Risk Insurance (Fire and Extended Coverage): Until the project is completed and accepted by the Owner, the Owner, or Contractor (at the Owner's option as indicated in the Supplemental General Conditions, Form HUD-4238-N) (is) (**is not**) required to maintain Builder's Risk Insurance (fire and extended coverage) on a 100 percent completed value basis on the insurable portion of the project for the benefit of the Owner, the Contractor, subcontractors as their interests may appear. The Contractor shall not include any costs for Builder's Risk Insurance (fire and extended coverage) premiums during construction unless the Contractor is required to provide such insurance; however, this provision shall not release the Contractor from his obligation to complete, according to plans and specifications, the project covered by the contract, and the Contractor and his Surety shall be obligated to full performance of the Contractor's undertaking.
- (f) Proof of Carriage of Insurance: The Contractor shall furnish the Owner with certificates showing the type, amount, class of operations covered, effective dates and date of expiration of policies. Such certificates shall also contain substantially the following statement: "The insurance covered by this certificate will not be cancelled or materially altered, except after ten (10) days written notice has been received by the Owner."

## 29. **Contract Security**

The Contractor shall furnish a performance bond in an amount at least equal to one hundred percent (100%) of the contract prices as security for the faithful performance of this contract and also a payment bond in an amount not less than

one hundred percent (100%) of the contract price or in a penal sum not less than that prescribed by State, territorial or local law, as security for the payment of all persons performing labor on the project under this contract and furnishing materials in connection with this contract. The performance bond and the payment bond may be in one or in separate instruments in accordance with local law.

**30. Additional or Substitute Bond**

If at any time the Owner for justifiable cause shall be or become dissatisfied with any surety or sureties, then upon the Performance or Payment Bonds, the Contractor shall within five (5) days after notice from the Owner so to do, substitute an acceptable bond (or bonds) in such form and sum and signed by such other surety or sureties as may be satisfactory to the Owner. The premiums on such bond shall be paid by the Contractor. No further payments shall be deemed due nor shall be made until the new surety or sureties shall have furnished such as acceptable bond to the Owner.

**31. Assignments**

The Contractor shall not assign the whole or any part of this contract or any moneys due or to become due hereunder without written consent of the Owner. In case the Contractor assigns all or any part of any moneys due or to become due under this contract, the instrument of assignment shall contain a clause substantially to the effect that it is agreed that the right of the assignee in and to any moneys due or to become due to the Contractor shall be subject to prior claims of all persons, firms and corporations or services rendered or materials supplied for the performance of the work called for in this contract.

**32. Mutual Responsibility of Contractors**

If, through acts of neglect on the part of the Contractor, any other Contractor or any subcontractor shall suffer loss or damage on the work, the Contractor agrees to settle with such other Contractor or subcontractor by agreement or arbitration if such other Contractor or subcontractors will so settle. If such other Contractor or subcontractor shall assert any claim against the Owner on account of any damage alleged to have been sustained, the Owner shall notify the Contractor, who shall indemnify and save harmless the Owner against any such claim.

**33. Separate Contract**

The Contractor shall coordinate his operations with those of other Contractors. Cooperation will be required in the arrangement for the storage of materials and in the detailed execution of the work. The Contractor, including his subcontractors, shall keep informed of the progress and the detail work of other Contractors and shall notify the Architect/Engineer immediately of lack of progress or defective workmanship on the part of other Contractors. Failure of a contractor to keep informed of the work progressing on the site and failure to give notice of lack of progress or defective workmanship on the part of other Contractors. Failure of a contractor to keep informed of the work progressing on the site and failure to give notice of lack of progress or defective workmanship by

others shall be construed as acceptance by him of the status of the work as being satisfactory for proper coordination with his own work.

#### **34. Subcontracting**

- (a) The Contractor may utilize the services of specialty subcontractors on those parts of the work which, under normal contracting practices, are performed by specialty subcontractors.
- (b) The Contractor shall not award any work to any subcontractor without prior written approval of the Owner, which approval will not be given until the Contractor submits to the Owner a written statement concerning the proposed award to the subcontractor, which statement shall contain such information as the Owner may require.
- (c) The Contractor shall be as fully responsible to the Owner for the acts and omissions of his subcontractors, and of persons either directly or indirectly employed by them, as he is for the acts and omissions of persons directly employed by him.
- (d) The Contractor shall cause appropriate provisions to be inserted in all subcontracts relative to the work to bind subcontractors to the Contractor by the terms of the General Conditions and other contract documents insofar as applicable to the work of subcontractors and to give the Contractor the same power as regards terminating any subcontract that the Owner may exercise over the Contractor under any provision of the contract documents.
- (e) Nothing contained in this contract shall create any contractual relation between any subcontractor and the Owner.

#### **35. Architect/Engineer's Authority**

The Architect/Engineer shall give all orders and directions contemplated under this contract and specifications, relative to the execution of the work. The Architect/Engineer shall determine the amount, quality, acceptability, and fitness of the several kinds of work and materials which are to be paid for under this contract and shall decide all questions which may arise in relation to said work and the construction thereof. The Architect/Engineer's estimates and decisions shall be final and conclusive, except as herein otherwise expressly provided. In case any question shall arise between the parties hereto relative to said contract or specifications, the determination or decision of the Architect/Engineer shall be a condition precedent to the right of the Contractor to receive any money or payment for work under this contract affected in any manner or to any extent by such question.

The Architect/Engineer shall decide the meaning and intent of any portion of the specifications and of any plans or drawings where the same may be found obscure or be in dispute. Any differences or conflicts in regard to their work which may arise between the Contractor under this contract and other Contractors performing work for the owner shall be adjusted and determined by the Architect/Engineer.

#### **36. State Allowances**

The Contractor shall include in his proposal the cash allowances stated in the Supplemental General Conditions. The Contractor shall purchase the "Allowed materials" as directed by the Owner on the basis of the lowest and best bid of at least three competitive bids. If the actual price for purchasing the "Allowed Materials" is more or less than the "Cash Allowance," the contract price shall be adjusted accordingly. The adjustment in contract price shall be made on the basis of the purchase price without additional charges for overhead, profit, insurance or any other incidental expenses. The cost of installation of the "Allowed materials" shall be included in the applicable section of the Contract Specifications covering this work.

**37 Use of Premises and Removal of Debris**

The Contract expressly undertakes at his own expense:

- (a) to take every precaution against injuries to persons or damage to property;
- (b) to store his apparatus, materials, supplies and equipment in such orderly fashion at the site of the work as will not unduly interfere with the progress of his work or the work of any other contractors;
- (c) to place upon the work or any part thereof only such loads as are consistent with the safety of that portion of the work;
- (d) to clean up frequently all refuse, rubbish, scrap materials, and debris caused by his operations, to the end that at all times the site of the work shall present a neat, orderly and workmanlike appearance;
- (e) before final payment to remove all surplus material, false-work, temporary structures, including foundations thereof, plant of any description and debris of every nature resulting from his operations;
- (f) to effect all cutting, fitting or patching of his work required to make the same to conform to the plans and specifications and, except with the consent of the Architect/Engineer, not to cut or otherwise alter the work of any other Contractor.

**38. Quantities of Estimate**

Wherever the estimated quantities of work to be done and materials to be furnished under this contract are shown in any of the documents including the proposal, they are given for use in comparing bids and the right is specially reserved except as herein otherwise specifically limited, to increase or diminish them as may be deemed reasonably necessary or desirable by the Owner to complete the work contemplated by this contract, and such increase or diminution shall in no way vitiate this contract, nor shall any such increase or diminution give cause for claims or liability for damages.

**39. Lands and Rights-of-Way**

Prior to the start of construction, the Owner shall obtain all lands and right-of-way necessary for the carrying out and completion of work to be performed under this contract.

**40. General Guaranty**

Neither the final certificate of payment nor any provision in the Contract Documents, nor partial or entire occupancy of the premises by the Owner, shall constitute an acceptance of work not done in accordance with the Contract Documents or relieve the Contractor of liability in respect to any express warranties or responsibility for faulty materials or workmanship. The Contractor shall remedy any defects in the work and pay for any damage to other work resulting therefrom, which shall appear within a period of one year from the date of final acceptance of the work unless a longer period is specified. The owner will give notice of observed defects with reasonable promptness.

**41. Conflicting Conditions**

Any Provisions in any of the Contract Documents which may be in conflict or inconsistent with any of the paragraphs in these General Conditions shall be void to the extent of such conflict or inconsistency.

**42. Notice and Service Thereof**

Any notice to any Contractor from the Owner relative to any part of this contract shall be in writing and considered delivered and the service thereof completed, when said notice is posted, by certified or registered mail, to the said Contractor at his last given address, or delivered in person to the said Contractor or his authorized representative on the work.

**43. Provisions Required by Law Deemed Inserted**

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

**44. Protection of Lives and Health**

"The Contractor shall exercise proper precaution at all times for the protection of persons and property and shall be responsible for all damages to persons or property, either on or off the site, which occur as a result of his prosecution of the work. The safety provisions of applicable laws and building and construction codes, in addition to specific safety and health regulations described by Chapter XIII, Bureau of Labor Standards, Department of Labor, Part 1518, Safety and Health Regulations for Construction, as outlined in the Federal Register, Volume 36, No. 75, Saturday, April 17, 1971. Title 29 - LABOR, shall be observed and the Contractor shall take or cause to be taken, such additional safety and health measures as the Contracting Authority may determine to be reasonably necessary."

**45. Subcontracts**

"The Contractor will insert in any subcontracts the Federal labor Standards Provisions contained herein and such other clauses as the Department of Housing and Urban Development may, by instructions require, and also a clause requiring the subcontractors to include these clauses in any lower tier

subcontracts which they may enter into, together with a clause requiring this insertion in any further subcontracts that may in turn be made."

**46. Equal Employment Opportunity**

During the performance of this contract the Contractor agrees as follows:

(1) The Contractor will not discriminate against any employee or applicant for employment because of race, religion, sex, color or national origin. The Contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, religion, sex, color, or national origin. Such action shall include, but not be limited to, the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination, rates of pay or 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 setting forth the provision of this nondiscrimination clause.

(2) The Contractor 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 race, religion, sex, color, or national origin".

(3) The Contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the labor union or worker's representative of the Contractor's commitments under Section 202 of Executive Order No. 11246 of September 24, 1965, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

(4) The Contractor will comply with all provisions of Executive Order No. 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.

(5) The Contractor will furnish all information and reports required by Executive Order No. 11246 of September 24, 1965, and by the rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the Department of Housing and Urban Development and the Secretary of labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

(6) In the event of the Contractor's noncompliance with the nondiscrimination clauses of this contract or with any of such rules, regulations, or orders, this contract may be cancelled, terminated, or suspended in whole or in part and the Contractor may be declared ineligible for further Government contracts or Federally-assisted construction contracts, in accordance with

procedures authorized in Executive Order No. 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order No. 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

- (7) The Contractor will include the provisions of paragraphs (1) through (7) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to Section 204 of Executive Order No. 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The Contractor will take such action with respect to any subcontract or purchase order as the Department of Housing and Urban Development may, direct as a means of enforcing such provisions, including sanctions for noncompliance: Provided, however, that in the event the Contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the Department of Housing and Urban Development, the Contractor may request the United States to enter into such litigation to protect the interests of the United States.

**47. Interest of Member of or Delegate to Congress**

No member of or Delegate to Congress, or Resident Commissioner, shall be admitted to any share or part of this contract or to any benefit that may arise therefrom but this provision shall not be construed to extend to this contract if made with a corporation for its general benefit.

**48. Other Prohibited Interests**

No official of the Owner who is authorized in such capacity and on behalf of the Owner to negotiate, make, accept or approve, or to take part in negotiating, making, accepting, or approving any architectural, engineering, inspection, construction or material supply contract or any subcontract in connection with the construction of the project, shall become directly or indirectly interested personally in this contractor in any part hereof. No officer, employee, architect, attorney, engineer or inspector of or for the Owner who is authorized in such capacity and on behalf of the Owner to exercise any legislative, executive, supervisory or other similar functions in connection with the construction of the project, shall become directly or indirectly interested personally in this contract or in any part thereof, any material supply contract, subcontract, insurance contract, or any other contract pertaining to the project.

**49. Use and Occupancy prior to Acceptance by Owner**

The Contractor agrees to use and occupancy of a portion or unit of the project before formal acceptance by the Owner, provided the Owner:

- (a) Secures written consent of the Contractor except in the event, in the opinion of the Architect/Engineer, the Contractor is chargeable with unwarranted delay in final cleanup of punch list items or other contract requirements.

- (b) Secures endorsement from the insurance-carrier and consent of the surety permitting occupancy of the building or use of the project during the remaining period of construction, or,
- (c) When the project consists of more than one building, and one of the buildings is occupied, secures permanent fire and extended coverage insurance, including a permit to complete construction. Consent of the surety must also be obtained.

(1) The Contractor will not discriminate against any employee or applicant for employment because of race, creed, color, or national origin. The Contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, creed, color, or national origin. Such action shall include, but not 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 setting forth the provisions of this nondiscrimination clause.

(2) The Contractor 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 race, creed, color, or national origin.

**50. Photographs of the Project**

If required by the Owner, the Contractor shall furnish photographs of the project, in the quantities and as described in the Supplemental General Conditions.

**51. Suspension of Work**

Should the Owner be prevented or enjoined from proceeding with work either before or after the start of construction by reason of any litigation or other reason beyond the control of the Owner, the Contractor shall not be entitled to make or assert claim for damage by reason of said delay; but time for completion of work will be extended to such reasonable time as the Owner may determine will compensate for time lost by such delay with such determination to be set forth in writing.

**52. Minimum Wages**

All laborers and mechanics employed upon the work covered by this Contract shall be paid unconditionally and not less often than once each week, and without subsequent deductions of rebate on any account (except such payroll deductions as are made mandatory by law and such other payroll deductions as are permitted by the applicable regulations issued by the Secretary of Labor, United States Department of Labor, pursuant to the Anti-Kickback Act hereinafter identified), the full amount due at time of payment computed at wage rates not less than those contained in the wage determination decision of said Secretary of Labor (a copy of which is attached and herein incorporated by



reference), regardless of any contractual relationship which may be alleged to exist between the Contractor or any subcontractor and such laborers and mechanics. All laborers and mechanics employed upon such work shall be paid in cash, except that payment may be by check if the employer provides or secures satisfactory facilities approved by the Local Public Agency or Public Body for the cashing of the same without cost or expense to the employee. For the purpose of this clause, contributions made or costs reasonably anticipated under Section 1 (b) (2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of Section 5.5 (a) (1) (iv) of Title 29, Code of Federal Regulations. Also for the purpose of this clause, regular contributions made or costs incurred for more than a weekly period under plans, funds, or programs, but covering the particular weekly period, are deemed to be constructively made or incurred during such weekly period.

**53. Underpayment Of Wages Or Salaries**

In case of underpayment of wages by the Contractor or by any subcontractor to laborers or mechanics employed by the Contractor or subcontractor upon the work covered by this Contract, the Local Public Agency or Public body in addition to such other rights as may be afforded it under this Contract shall withhold from the Contractor, out of any payments due the Contractor, so much thereof as the Local Public Agency or Public Body may consider necessary to pay each laborers or mechanics the full amount of wages required by this Contract. The amount so withheld may be disbursed by the Local Public Agency or Public Body, for and on account of the Contractor or his subcontractor (as may be appropriate), to the respective laborers or mechanics to whom the same is due or on their behalf to plan, funds, or programs for any type of fringe benefit prescribed in the applicable wage determination.

**54. Anticipated Costs of Fringe Benefits**

If the Contractor does not make payments to a trustee or other third person, he may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing fringe benefits under a plan or program of a type expressly listed in the wage determination decision of the Secretary of Labor which is a part of this Contract: Provided, however, The Secretary of Labor has found, upon the written request of the Contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the Contractor to set aside in a separate account assets for the meeting of obligations under the plan or programs. A copy of any findings made by the Secretary of Labor in respect to fringe benefits being provided by the Contractor must be submitted to the Local Public Agency or Public Body with the first payroll filed by the Contractor subsequent to receipts of the findings.

**55. Overtime Compensation Required by Contract Work Hours and Safety Standards Act (76 Stat. 357-360: Title 40 U.S.C., Section 327-332)**

(a) Overtime requirements. No Contractor or subcontractor contracting for any part of the Contract work which may require or involve the employment of laborers or mechanics, including watchmen and guards, shall require or

permit any laborer or mechanic in any workweek in which he is employed on such work to work in excess of 8 hours in any calendar day or in excess of 40 hours in such work week unless such laborer or mechanic receives compensation at a rate not less than one and one-half times his basic rate of pay for all hours worked in excess of 8 hours in a calendar day or in excess of 40 hours in such work week, as the case may be.

- (b) Violation: liability for unpaid wages liquidated damages . In the event of any violation of the clause set forth in paragraph (a), the Contractor and any subcontractor responsible therefor shall be liable to any affected employee for his unpaid wages. In addition, such Contractor and subcontractor shall be liable to the United States for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic employed in violation of the clause set forth in paragraph (a), in the sum of \$10 for each calendar day on which such employee was required or permitted to work in excessive of 8 hours or in excessive of the standard workweek of 40 hours without payment of the overtime wages required by the clause set forth in paragraph (a).
- (c) Withholding for liquidated damages. The Local Public Agency or Public Body shall withhold or cause to be withheld, from any monies payable on account work performed by the Contractor or subcontractor, such sums as may administratively be determined to be necessary to satisfy any liabilities of such Contractor or subcontractor for liquidated damages as provided in the clause set forth in paragraph (b).
- (d) Subcontracts. The Contractor shall insert in any subcontracts the clauses in paragraph (a), (b), and (c) of this Section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontractors which they may enter into, together with a clause requiring this insertion in any further subcontracts that may in turn be made.

## **56. Employment of Apprentices/Trainees**

- (a) Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Manpower Administration, Bureau of Apprenticeship Agency recognized by the Bureau, or if a person is employed in his first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Bureau of Apprenticeship and Training or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen in any craft classification shall not be greater than the ratio permitted to the contractor as to his entire work force under the registered program. Any employee listed on payroll at an apprentice wage rate, who is not a trainee as defined in subdivision (b) of this subparagraph or is not registered or otherwise employed as stated above, shall be paid the wage rate determined by the Secretary of Labor for the classification of work he actually performed. The contractor or subcontractor will be required to furnish to the contracting officer or representative of the Wage-Hour Division of the Labor written evidence of the registration of his program and apprentices as well the appropriate ratios and wage rates (expressed in percentages of the journeyman hourly rates), for the area of construction prior to using any apprentices on the contract work. The wage rate paid apprentices shall be not less than the appropriate percentage of the journeyman's rate contained in the applicable wage determination.
- (b) Trainees. Except as provided in 29 CFR 5.15 trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidence by formal certification, by the U.S. Department of Labor, Manpower Administration, Bureau of Apprentice and Training. The ratio of trainees to journeymen shall not be greater than permitted under the plan approved by the Bureau of Apprenticeship and Training. Every trainee must be paid at not less than the rate specified in the approved program for his level of progress. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Bureau of Apprenticeship and Training shall be paid not less than the wage determined by the Secretary of Labor for the classification of work he actually performed. The contractor or subcontractor will be required to furnish the contracting officer or a representative of the Wage-Hour Division of the U.S. Department of Labor Written evidence of the certification of his program, the registration of the trainees, and the ratios and wage prescribed in that program, In the event the Bureau of Apprenticeship and Training withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.
- (c) Equal Employment Opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR Parts 30.

#### **57. Employment of Certain Persons Prohibited**

No person under the age of sixteen years and no person who, at the time, is serving sentence in a penal or correctional institute shall be employed on the work covered by this Contract.

**58. Regulations Pursuant to So-Called "Anti-Kickback Act"**

The Contractor shall comply with the applicable regulations (a copy of which is attached and herein incorporated by references) or the Secretary of Labor, United States Department of Labor, made pursuant to the so-called "Anti-Kickback Act" of June 13, 1934 (48 Stat. 948: 62 Stat. 862; Title U.S.C., Section 874: and Title 40 U.S.C., Section 276 (c), and any amendments or modifications thereof, shall cause appropriate provisions to be inserted in subcontracts to insure compliance therewith by all subcontracts subject thereto, and shall be responsible for the submission of affidavits required by subcontractors thereunder except as said Secretary of Labor may specifically provide for reasonable limitations, variations, tolerances, and exemptions from the requirements thereof.

**59. Employment of Laborers or Mechanics Not Listed in Aforesaid Wage Determination Decision**

Any class of laborers or mechanics which is not listed in the wage determination and which is to be employed under the Contract will be classified or reclassified conformably to the wage determination by the Local Public Agency or Public Body, and a report of the action taken shall be submitted by the Local Public Agency or Public Body, through the Secretary of Housing and Urban Development, to the Secretary of Labor, United States Department of Labor. In the event the interested parties cannot agree on the proper classification or reclassification of a particular class of laborers and mechanics to be used, the question accompanied by the recommendation of the Local Public Agency or Public Body shall be referred, through the Secretary of Housing and Urban Development, to the Secretary of Labor for final determination.

**60. Fringe Benefits Not Expressed as Hourly Wage Rates**

The Local Public Agency or Public Body shall require, whenever the minimum wage rate prescribed in the Contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly wage rate and the Contractor is obligated to pay cash equivalent of such a fringe benefit, and hourly cash equivalent thereof to be established. In the event the interested parties cannot agree upon a cash equivalent of the fringe benefit, the question, accompanied by the recommendation of the Local Public Agency or Public Body, shall be referred, through the Secretary of Housing and Urban Development, to the Secretary of Labor for determination.

**61. Posting Wage Determination Decision and Authorized Wage Deductions**

The applicable wage poster of the Secretary of Labor, United States Department of Labor, and the applicable wage determination decisions of said Secretary of Labor with respect to the various classification of laborers and mechanics employed and to be employed upon the work covered by this Contract, and a statement showing all deductions, if any, in accordance with the provisions of this Contract, to be made from wages actually earned by persons so employed or to be employed in such classifications, shall be posted at appropriate conspicuous points at the site of the work.

**62. Complaints, Proceedings, or Testimony by Employees**

No laborer or mechanic to whom the wage, salary, or other labor standards provision of this Contract are applicable shall be discharged or in any other manner discriminated against by Contractor or any subcontractor because such employee has filed any complaint or instituted or caused to be instituted any proceeding or has testified or is about to testify, in any proceeding under or relating to the labor standards applicable under this Contract to his employer.

**63. Claims and Disputes Pertaining to Wage Rates**

Claims and disputes pertaining to wage rates or to classification of laborers and mechanics employed upon the work covered by this Contract shall be promptly reported by the Contractor in writing to the Local Public Agency or Public Body for referral by letter through the Secretary of Labor, United States Department of Labor, whose decision shall be final with respect thereto.

**64. Questions Concerning Certain Federal Statutes and Regulations**

All questions arising under this Contract which relate to the application of interpretation of (a) the aforesaid Anti-Kickback Act, (b) the Contract Work Hours and Safety Standards Act (c) the aforesaid Davis-Bacon Act, (d) the regulations of issued by the Secretary of Labor, United States Department of Labor, pursuant to said Acts, or (c) the labor standards provisions of any other pertinent Federal statute, shall be referred, through the Local Public Agency or Public Body and the Secretary of housing and Urban Development, to the said Secretary's appropriated ruling or interpretation which shall be authoritative and may be relied upon for the purposes of this Contract.

**65. Payroll and Basic Payroll Records of Contractor and Subcontractors**

The Contractor and each subcontractor shall prepare his payrolls on forms satisfactory to and in accordance with instructions to be furnished by the Local Public Agency or Public Body. The Contractor shall submit weekly to the Local Public Agency or Public Body two certified copies of all payrolls of the Contractor and of the subcontractors, it being understood that the Contractor shall be responsible for the submission of copies of payrolls of all subcontractors. Each such payroll shall contain the "Weekly Statement of Compliance" set forth in Section 3.3 of Title 29, Code of Federal Regulations. The payrolls and basic payroll records of the Contractor and each subcontractor covering all laborers and mechanics employed upon the work covered by this Contract shall be maintained during the course of the work and preserved for a period of 3 years thereafter. Such payrolls and basic payroll records shall contain the name and address of each such employee, his correct classification, rate of pay (including rates of contribution or costs anticipated of the types described in Section 1(b) (2) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made, and actual wages paid. In addition, whenever the Secretary of Labor has found under Section 5.5 (a) (1) (iv) of Title 29, Code of Federal Regulations, that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in Section 1(b) (2) (B) of the Davis-Bacon Act, the Contractor or subcontractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. The Contractor and

each subcontractor shall make his employment records with respect to persons employed by him upon the work covered by this Contract available for inspection by authorized representatives of the Secretary of Housing and Urban Development, the Local Public Agency or Public Body, and the United States Department of Labor. Such representatives shall be permitted to interview employees of the Contractor or of any subcontractor during working hours on the job.

**66. Specific Coverage Of Certain Types Of Work By Employees**

The transportation of material and supplies to or from the site of the Project or Program to which this Contract pertains by the employees of the Contractor or of any subcontractor, and manufacturing or furnishing of materials, articles, supplies, or equipment on the site of the Project or Programs to which this Contract pertains by person employed by the Contractor or any subcontractor, shall, for the purposes of this Contract, and without limiting the generality of the foregoing provisions of this Contract, be deemed to be work to which these Federal Labor Standards Provisions are applicable.

**67. Ineligible Subcontractors**

The Contractor shall not subcontract any part of the work covered by this Contract or permit subcontracted work to be further subcontracted without the Local Public Agency's or Public Body's prior written approval of the subcontractor. The Local Public Agency or Public Body will not approve any subcontractor for work covered by this Contract who is at the time ineligible under the provisions of any applicable regulations issued by the Secretary of Labor, United States Department of Labor or the Secretary of Housing and Urban Development, to receive an award of such subcontract.

**68. Provisions to Be Included in Certain Subcontracts**

The Contractor shall include or cause to be included in each subcontract covering any of the work covered by this Contract, provisions which are consistent with these Federal Labor Standards Provisions and also a clause requiring the subcontractors to include such provisions in any lower tier subcontracts which they may enter into, together with a clause requiring such insertion in any further subcontracts that may in turn be made.

**69. Breach of Foregoing Federal Labor Standards Provisions**

In addition to the cause for termination of this Contractor as herein elsewhere set forth, the Local Public Agency or Public Body reserves the right to terminate this Contract if the Contractor or any subcontractor whose subcontract covers any of the work covered by this Contract shall breach any of these Federal Labor Standards Provisions. A breach of these Federal Standards Provisions may also be grounds for debarment as provided by the applicable regulation issued by the Secretary of Labor, United States Department of Labor.

**70. Employment Practices**

The Contractor (1) shall, to the greatest extent practicable, follow hiring and employment practices for work on the project which will provide new job opportunities for the unemployed and underemployed, and (2) shall insert or cause to be inserted the same provision in each construction subcontract.

**71. Contract Termination; Debarment**

A breach of Section 45 and the Federal Labor Standards Provisions, may be grounds for termination of the contract, and for debarment as provided in 29 CFR 5.6.

**U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT  
SUPPLEMENTAL GENERAL CONDITIONS**

HUD-4238

1. Enumeration of Plans, Specifications and Addenda
2. Stated Allowances
3. Special Hazards
4. Public Liability and Property Damage Insurance
5. Photographs of Project
6. Schedule of Minimum Hourly Wage Rates
7. Builder's Risk Insurance
8. Special Equal Opportunity Provisions
9. Certification of Compliance with Air and Water Acts
10. Special Conditions Pertaining to Hazards, Safety Standards and Accident Prevention

**1. ENUMERATION OF PLANS, SPECIFICATIONS AND ADDENDA**

Following are the Plans, Specifications and Addenda which form a part of this contract, as set forth in Paragraph 1 of the General Conditions, "Contract and Contract Documents":

**DRAWINGS**

General Construction:	Nos.
Heating and Ventilating:	"
Plumbing:	"
Electrical:	"
_____	"
_____	"

**SPECIFICATIONS:**

General Construction:	Page _____ to _____ , incl.
Heating and Ventilating:	" _____ to _____ , incl.
Plumbing:	" _____ to _____ , incl.
Electrical:	" _____ to _____ , incl.
_____	" _____ to _____ , incl.
_____	" _____ to _____ , incl.

**ADDENDA:**

No. _____	Date _____	No. _____	Date _____
No. _____	Date _____	No. _____	Date _____

**2. STATED ALLOWANCES**

Pursuant to paragraph 36 of the General Conditions, the contractor shall include the following cash allowances in his proposal:

(a) For _____	(Page _____ of Specifications	\$ _____
(b) For _____	(Page _____ of Specifications	\$ _____
(c) For _____	(Page _____ of Specifications	\$ _____
(d) For _____	(Page _____ of Specifications	\$ _____
(e) For _____	(Page _____ of Specifications	\$ _____
(f) For _____	(Page _____ of Specifications	\$ _____

**3. SPECIAL HAZARDS**

The Contractor's and his Subcontractor's Public Liability and Property Damage Insurance shall provide adequate protection against the following special hazards.



**4. CONTRACTOR'S AND SUBCONTRACTOR'S PUBLIC LIABILITY, VEHICLE LIABILITY, AND PROPERTY DAMAGE INSURANCE**

As required under paragraph 28 of the General Conditions, the Contractor's Public Liability Insurance and Vehicle Liability Insurance shall be in an amount not less than \$ 300,000.00 for injuries, including accidental death, to any one person, and subject to the same limit for each person, in an amount not less than \$ 500,000.00 on account of one accident, and Contractor's Property Damage Insurance in an amount not less than \$ 500,000.00.

The Contractor shall either (1) require each of his subcontractors to procure and to maintain during the life of his subcontract, Subcontractor's Public Liability and Property Damage of the type and in the same amounts as specified in the preceding paragraph, or (2) insure the activities of his subcontractors in his own policy.

**5. PHOTOGRAPHS OF PROJECT**

As provided in paragraph 50 of the General conditions, the Contractor will furnish photographs in the number, type, and stage as enumerated below:

**6. SCHEDULE OF OCCUPATIONAL CLASSIFICATIONS AND MINIMUM HOURLY WAGE RATES AS REQUIRED UNDER PARAGRAPH 52 OF THE GENERAL CONDITIONS**

Given on Pages 1, 2, 3, and 4 of the Davis Bacon Wage Decision.

**7. BUILDER'S RISK INSURANCE**

As provided in the General Conditions, paragraph 28(e), the Contractor ~~will~~**will not** maintain Builder's Risk Insurance (fire and extended coverage) on a 100 percent completed value basis on the insurable portions of the project for the benefit of the Owner, the Contractor, and all subcontractors, as their interests may appear. **\*Strike out one.**

**8. SPECIAL EQUAL OPPORTUNITY PROVISIONS**

A. Activities and Contracts Not Subject to Executive Order 11246, as Amended  
(Applicable to Federally assisted construction contracts and related subcontracts under \$10,000)

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

- (1) The Contractor shall not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. The contractor shall take affirmative action to ensure that applicants for employment are employed, and that employees are treated during employment, without regard to their race, color, religion, sex, or national origin. Such action shall include, but not be limited to, the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship.
- (2) The contractor shall post in conspicuous places, available to employees and applicants for employment, notices to be provided by Contracting Officer setting forth the provisions of this nondiscrimination clause. The Contractor shall state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, or national origin.
- (3) Contractors shall incorporate foregoing requirement in all subcontracts.

B. Contracts Subject to Executive Order 11246, as Amended

(Applicable to Farewell assisted construction contracts and related subcontracts exceeding \$10,000.00)

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

- (1) The Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. The Contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, color, religion, sex, or national origin. Such action shall include, but not be limited to, the following: employment, upgrading, demotion, or transfer, recruitment or recruitment advertising; layoff or termination; rates of pay or 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 contracting officer setting forth the provisions of this nondiscrimination clause.
- (2) The Contractor 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 race, color, religion, sex, or national origin.
- (3) The Contractor will send to each labor union or representative of workers within which he has a collective bargaining agreement or other contract or understanding, a notice to be provided by the Contract Compliance Officer advising the said labor union or workers' representatives of the Contractor's commitment under this section and shall post copies of the notice in conspicuous places available to employees and applicants for employment.
- (4) The Contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and the rules, regulation and relevant order of the Secretary of Labor.
- (5) The Contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by the rules, regulations and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the Department and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.
- (6) In the event of the contractor's noncompliance with the nondiscrimination clauses of this contract, or which any of such rules, regulation, or orders, this contract may be canceled, terminated or suspended in whole or in part and the Contractor may be declared ineligible for further Government contracts or federally assisted construction contract procedures authorized in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

(7) The Contractor will include the portion of the sentence immediately preceding paragraph (1) and the provisions of paragraph (1) through (7) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to Section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The Contractor will take such action with respect to any subcontract or purchase orders as the Department may direct as a means of enforcing such provisions, including sanctions for noncompliance: Provided, however, that in the event a Contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the Department, the Contractor may request the United States to enter into such litigation to protect the interest of the United States.

8. Home town or Imposed Plans

In areas where a home town plan or imposed plan is operative, the Community Development Block Grant Recipient must contact the appropriate HUD Equal Opportunity Office for specific instructions.

9. CERTIFICATION OF COMPLIANCE WITH AIR AND WATER ACTS

(Applicable to Federally assisted construction contracts and related subcontract exceeding \$100,000.00)

Compliance with Air and Water Acts

During the performance of this contract, the contractor and all subcontractors shall comply with the requirements of the Clean Air Act, as amended, 42 USE 1857 et seq., the Federal Water Pollution Control Act, as amended, 33 USE 1251 et seq., and the regulations of the Environmental Protection Agency with respect thereto, at 40 CFR Part 15, as amended.

In addition to the foregoing requirements, all nonexempt contractors and subcontractors shall furnish to the owner, the following.

(1) A stipulation by the Contractor or subcontractors, that any facility to be utilized in the performance of any nonexempt contract or subcontract, is not listed on the list of Violating Facilities issued by the Environmental Protection Agency (EPA) pursuant to 40 CFR 15.20.

(2) Agreement by the contractor to comply with all the requirements of Section 114 of the Clean Air Act, as amended, (42 USE 1857c-8) and Section 308 of the Federal Water Pollution Control Act, as amended, (33 USE 1318) relating to inspection, monitoring, entry, reports and information, as well as all other requirements specified in said Section 114 and Section 308, and all regulations and guidelines issued thereunder.

(3) A stipulation that as a condition for the award of the contract, prompt notice will be given of any notification received from the Director, Office of Federal Activities, EPA, indicating that a facility utilized or to be utilized for the contract, is under consideration to be listed on the EPA List of Violating Facilities.

(4) Agreement by the Contractor that he will include, or cause to be included, the criteria and requirements in paragraph (1) through (4) of this section in every

nonexempt subcontract and requiring that the Contractor will take such action as the Government may direct as a means of enforcing such provisions.

10. SPECIAL CONDITIONS PERTAINING TO HAZARDS SAFETY STANDARDS AND ACCIDENT PREVENTION

A. Lead-Based Paint Hazards (Applicable to contracts for construction or rehabilitation of residential structures)

The construction or rehabilitation of residential structures is subject to the HUD Lead-Based Paint regulations, 24 CFR Part 35. the Contractor and Subcontractor shall comply with the provisions for the elimination of lead-base paint hazards under sub-part B of said regulations. The Owner will be responsible for the inspections and certifications required under Section 35.14(f) thereof.

B. Use of Explosives (Modify as Required)

When the use of explosive is necessary for the prosecution of the work, the Contractor shall observe all local, state and Federal laws in purchasing and handling explosives. The Contractor shall take all necessary precaution to protect completed work, neighboring property, water lines, or other undergoing structures. Where there is danger to structures or property from blasting, the charges shall be reduced and the material shall be covered with suitable timber, steel or rope mats.

The Contractor shall notify all owners of public utility property of intention to use explosives at least eight hours before blasting is done, close to such property. Any supervision or direction of use of explosive by the Engineer, does not in any way reduce the responsibility of the Contractor or his Surety for damages that may be caused by such use.

C. Danger Signals and Safety Devices (Modify as Required)

The contractor shall make all necessary precautions to guard against damages to property and injury to persons. He shall put up and maintain in good condition, sufficient red or warning lights at night, suitable barricades and other devices necessary to protect the public. In case the Contractor fails or neglects to take such precautions, the Owner may have such lights and barricades installed and charge the cost of this work to the Contractor. Such action by the Owner does not relieve the Contractor of any liability incurred under those specifications or contract.

D. "Section 3" Compliance in the Provision of Training, Employment and Business Opportunities

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

- (1) The contractor agrees to comply with the requirements of Section 3 of the Housing and Urban Development Act of 1968 (12 USE 170(u), as amended, the HUD regulations issued pursuant thereto at 24 CFR Part 135, and any applicable rules and orders of HUD issued thereunder.

- (2) The "Section 3 clause" set forth in 24 CFR 135.20(b) shall form part of this contract, as set forth in Paragraph 1 of the General Conditions, "Contract and Contract Documents".
- (3) Contractors shall incorporate the "Section 3 clause" shown below and the foregoing requirements in all subcontracts.

### **Section 3 Clause as Set Forth in 24 CFR 135.20 (b)**

- A. The work to be performed under this Contract is on a project assisted under a program providing direct Federal financial assistance from HUD and is subject to the requirements of Section 3 of the Housing and Urban Development Act of 1968, as amended, 12 U.S.C. 1701u. Section 3 requires that, to the greatest extent feasible, opportunities for training and employment be given to lower-income residents of the project area and contracts for work in connection with project be awarded to business concerns which are located in, or owned in substantial part by persons residing in the area of the project.
- B. The parties to this Contract will comply with the provisions of Section 3 and the regulations issued by HUD as set forth in 24CFR, Part 135, and all applicable rules and orders of HUD issues thereunder prior to the execution of the Agreement. The parties to this Contract certify and agree that they are under no contractual or other disability, which would prevent them from complying with these requirements.
- C. The Contractor will send to each labor organization or representative of workers with which the contractor has a collective bargaining agreement or other contract or understanding, if any, a notice advising the labor organization or workers' representative of the commitments under this Section 3 clause and shall post copies of the notice in conspicuous places available to employees and applicants for employment and training.
- D. The contractor will include this Section 3 clause in every subcontractor for work in connection with the project and will at the direction of the applicant for or recipient of Federal financial assistance, take appropriate action pursuant to the subcontract upon a finding that the subcontractor is in violation of regulations under 24 CDR, Part 135. The contractor will not subcontract with any subcontractor where the contractor has notice or knowledge that the latter has been found in violation of regulations under 24 CFR, Part 135, and will not let any subcontract unless the subcontractor has first provided the contractor with a preliminary statement of ability to comply with the requirements of these regulations.
- E. Compliance with the provisions of Section 3, the regulations set forth in 24 CFR, Part 135, and all applicable rules and order of the Department issues thereunder prior to the execution of the Agreement to Enter Into Housing Assistance Payments Contract, shall be a condition of the Federal financial assistance provided to the project, binding upon the Owner, the Owner's contractors, and subcontractors, successors, and assigns. Failure to fulfill these requirements shall subject the Owner, the Owner's contractors, successors, and assigns to those sanctions specified by the Agreement to Enter Into Housing Assistance Payments Contract, and to such sanctions as are specified in 24 CFR, Section 135.

**\*\*Attachment to Federal Labor Standards Provisions**

General Decision Number: TX180305 01/05/2018 TX305

Superseded General Decision Number: TX20170305

State: Texas

Construction Type: Building

County: Hidalgo County in Texas.

BUILDING CONSTRUCTION PROJECTS (does not include single family homes or apartments up to and including 4 stories).

Note: Under Executive Order (EO) 13658, an hourly minimum wage of \$10.35 for calendar year 2018 applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2015. If this contract is covered by the EO, the contractor must pay all workers in any classification listed on this wage determination at least \$10.35 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in calendar year 2018. The EO minimum wage rate will be adjusted annually. Please note that this EO applies to the above-mentioned types of contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but it does not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(2)-(60). Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Modification Number 0 Publication Date 01/05/2018

BOIL0074-003 01/01/2017

	Rates	Fringes
BOILERMAKER.....	\$ 28.00	22.35

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ENGI0178-005 06/01/2014

	Rates	Fringes
POWER EQUIPMENT OPERATOR		
(1) Tower Crane.....	\$ 29.00	10.60
(2) Cranes with Pile Driving or Caisson Attachment and Hydraulic Crane 60 tons and above.....	\$ 28.75	10.60
(3) Hydraulic cranes 59 Tons and under.....	\$ 27.50	10.60

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\* IRON0084-011 06/01/2017

	Rates	Fringes
IRONWORKER, ORNAMENTAL.....	\$ 23.27	7.12

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PLUM0412-004 04/01/2013

Rates Fringes

PLUMBER.....\$ 31.14                      12.43

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SUTX2014-031 07/21/2014

	Rates	Fringes
BRICKLAYER.....	\$ 16.17	0.00
CARPENTER.....	\$ 14.21	2.22
CEMENT MASON/CONCRETE FINISHER...	\$ 12.46	0.00
ELECTRICIAN.....	\$ 18.44	4.53
INSULATOR - MECHANICAL (Duct, Pipe & Mechanical System Insulation).....	\$ 11.54	2.17
IRONWORKER, REINFORCING.....	\$ 12.01	0.00
IRONWORKER, STRUCTURAL.....	\$ 15.04	4.34
LABORER: Common or General.....	\$ 8.00	0.00
LABORER: Mason Tender - Brick...	\$ 10.00	0.00
LABORER: Mason Tender - Cement/Concrete.....	\$ 10.89	0.96
LABORER: Pipelayer.....	\$ 11.00	3.47
LABORER: Roof Tearoff.....	\$ 10.06	0.00
OPERATOR: Backhoe/Excavator/Trackhoe.....	\$ 14.04	1.01
OPERATOR: Bobcat/Skid Steer/Skid Loader.....	\$ 13.93	0.00
OPERATOR: Bulldozer.....	\$ 18.29	1.31
OPERATOR: Drill.....	\$ 16.22	0.34
OPERATOR: Forklift.....	\$ 14.83	0.00
OPERATOR: Grader/Blade.....	\$ 10.00	0.00
OPERATOR: Loader.....	\$ 12.87	0.70
OPERATOR: Mechanic.....	\$ 17.00	0.00
OPERATOR: Paver (Asphalt, Aggregate, and Concrete).....	\$ 16.03	0.00
OPERATOR: Roller.....	\$ 12.70	0.00
PAINTER (Brush, Roller, and Spray).....	\$ 11.27	0.00
PIPEFITTER.....	\$ 15.22	3.16
ROOFER.....	\$ 11.42	0.00
SHEET METAL WORKER (HVAC Duct		



Installation Only).....	\$ 18.40	2.12
SHEET METAL WORKER, Excludes HVAC Duct Installation.....	\$ 21.13	6.53
TILE FINISHER.....	\$ 11.22	0.00
TILE SETTER.....	\$ 12.15	0.00
TRUCK DRIVER: Dump Truck.....	\$ 12.39	1.18
TRUCK DRIVER: Flatbed Truck.....	\$ 19.65	8.57
TRUCK DRIVER: Semi-Trailer Truck.....	\$ 12.50	0.00
TRUCK DRIVER: Water Truck.....	\$ 12.00	4.11

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WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at [www.dol.gov/whd/govcontracts](http://www.dol.gov/whd/govcontracts).

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

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The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of "identifiers" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than "SU" or "UAVG" denotes that the union classification and rate were

prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

#### Survey Rate Identifiers

Classifications listed under the "SU" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

#### Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

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#### WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

- \* an existing published wage determination
- \* a survey underlying a wage determination
- \* a Wage and Hour Division letter setting forth a position on a wage determination matter

\* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations  
Wage and Hour Division  
U.S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator  
U.S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board  
U.S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISION

# Title 29 – LABOR

## Subtitle A – Office of The Secretary of Labor

### PART 3 - CONTRACTORS AND SUBCONTRACTORS ON PUBLIC BUILDING OR PUBLIC WORK FINANCED IN WHOLE OR IN PART BY LOANS OR GRANTS FROM THE UNITED STATES

<u>Sect.</u>	<u>Name</u>
3.1	Purpose and scope.
3.2	Definitions.
3.3	Weekly statement with respect to payment of wages.
3.4	Submission of weekly statements and the preservation and inspection of weekly payroll records.
3.5	Payroll deductions permissible without application to or approval of the Secretary of Labor.
3.6	Payroll deductions permissible with the approval of the Secretary of Labor.
3.7	Applications for the approval of the Secretary of Labor.
3.8	Action by the Secretary of Labor upon applications.
3.9	Prohibited payroll deductions.
3.10	Methods of payment of wages.
3.11	Regulations part of contract.

**Authority:** R.S. 161, sec. 2, 48 Stat. 848; Reorg. Plan No. 14, of 1950, 64 Stat. 1267; 5 U.S.C. 301; 40 U.S.C. 276c.  
**Source:** 29 FR 97, Jan. 4, 1964, unless otherwise noted.

#### **29 CFR 3.1 - Purpose and scope.**

This part prescribes "anti-kickback" regulations under section 2 of the Act of June 13, 1934, as amended (40 U.S.C. 276c), popularly known as the Copeland Act. This part applies to any contract which is subject to Federal wage standards and which is for the construction, prosecution, completion, or repair of public buildings, public works or buildings or works financed in whole or in part by loans or grants from the United States. The part is intended to aid in the enforcement of the minimum wage provisions of the Davis-Bacon Act and the various statutes dealing with federally assisted construction that contain similar minimum wage provisions, including those provisions which are not subject to Reorganization Plan No. 14 (e.g., the College Housing Act of 1950, the Federal Water Pollution Control Act, and the Housing Act of 1959), and in the enforcement of the overtime provisions of the Contract Work Hours Standards Act whenever they are applicable to construction work. The part details the obligation of contractors and subcontractors relative to the weekly submission of statements regarding the wages paid on work covered thereby; sets forth the circumstances and procedures governing the making of payroll deductions from the wages of those employed on such work; and delineates the methods of payment permissible on such work.

#### **29 CFR 3.2 - Definitions.**

As used in the regulations in this part:

(a) The terms building or work generally include construction activity as distinguished from manufacturing, furnishing of materials, or servicing and maintenance work. The terms include, without limitation, buildings, structures, and improvements of all types, such as bridges, dams, plants, highways, parkways, streets, subways, tunnels, sewers, mains, powerlines, pumping stations, railways, airports, terminals, docks, piers, wharves, ways, lighthouses, buoys, jetties, breakwaters, levees, and canals; dredging, shoring, scaffolding, drilling, blasting, excavating, clearing, and landscaping. Unless conducted in connection with and at the site of such a building or work as is described in the foregoing sentence, the manufacture or furnishing of materials, articles, supplies, or equipment (whether or not a Federal or State agency acquires title to such materials, articles, supplies, or equipment during the course of the manufacture or furnishing, or owns the materials from which they are manufactured or furnished) is not a building or work within the meaning of the regulations in this part.

(b) The terms construction, prosecution, completion, or repair mean all types of work done on a particular building or work at the site thereof, including, without limitation, altering, remodeling, painting and decorating, the transporting of materials and supplies to or from the building or work by the employees of the construction contractor or construction subcontractor, and the manufacturing or furnishing of materials, articles, supplies, or equipment on the site of the building or work, by persons employed at the site by the contractor or subcontractor.

(c) The terms public building or public work include building or work for whose construction, prosecution, completion, or repair, as defined above, a Federal agency is a contracting party, regardless of whether title thereof is in a Federal agency.

(d) The term building or work financed in whole or in part by loans or grants from the United States includes building or work for whose construction, prosecution, completion, or repair, as defined above, payment or part payment is made directly or indirectly from funds provided by loans or grants by a Federal agency. The term includes building or work for which the Federal assistance granted is in the form of loan guarantees or insurance.

(e) Every person paid by a contractor or subcontractor in any manner for his labor in the construction, prosecution, completion, or repair of a public building or public work or building or work financed in whole or in part by loans or grants from the United States is employed and receiving wages, regardless of any contractual relationship alleged to exist between him and the real employer.

(f) The term any affiliated person includes a spouse, child, parent, or other close relative of the contractor or subcontractor; a partner or officer of the contractor or subcontractor; a corporation closely connected with the contractor or subcontractor as parent, subsidiary, or otherwise, and an officer or agent of such corporation.

(g) The term Federal agency means the United States, the District of Columbia, and all executive departments, independent establishments, administrative agencies, and instrumentalities of the United States and of the District of Columbia, including corporations, all or substantially all of the stock of which is beneficially owned by the United States, by the District of Columbia, or any of the foregoing departments, establishments, agencies, and instrumentalities.

[29 FR 97, Jan. 4, 1964, as amended at 38 FR 32575, Nov. 27, 1973]

### **29 CFR 3.3 - Weekly statement with respect to payment of wages.**

(a) As used in this section, the term employee shall not apply to persons in classifications higher than that of laborer or mechanic and those who are the immediate supervisors of such employees.

(b) Each contractor or subcontractor engaged in the construction, prosecution, completion, or repair of any public building or public work, or building or work financed in whole or in part by loans or grants from the United States, shall furnish each week a statement with respect to the wages paid each of its employees engaged on work covered by this part 3 and part 5 of this chapter during the preceding weekly payroll period. This statement shall be executed by the contractor or subcontractor or by an authorized officer or employee of the contractor or subcontractor who supervises the payment of wages, and shall be on form WH 348, "Statement of Compliance", or on an identical form on the back of WH 347, "Payroll (For Contractors Optional Use)" or on any form with identical wording. Sample copies of WH 347 and WH 348 may be obtained from the Government contracting or sponsoring agency, and copies of these forms may be purchased at the Government Printing Office.

(c) The requirements of this section shall not apply to any contract of \$2,000 or less.

(d) Upon a written finding by the head of a Federal agency, the Secretary of Labor may provide reasonable limitations, variations, tolerances, and exemptions from the requirements of this section subject to such conditions as the Secretary of Labor may specify.

[29 FR 97, Jan. 4, 1964, as amended at 33 FR 10186, July 17, 1968; 47 FR 23679, May 28, 1982]

## **29 CFR 3.4 - Submission of weekly statements and the preservation and inspection of weekly payroll records.**

(a) Each weekly statement required under Sec. 3.3 shall be delivered by the contractor or subcontractor, within seven days after the regular payment date of the payroll period, to a representative of a Federal or State agency in charge at the site of the building or work, or, if there is no representative of a Federal or State agency at the site of the building or work, the statement shall be mailed by the contractor or subcontractor, within such time, to a Federal or State agency contracting for or financing the building or work. After such examination and check as may be made, such statement, or a copy thereof, shall be kept available, or shall be transmitted together with a report of any violation, in accordance with applicable procedures prescribed by the United States Department of Labor.

(b) Each contractor or subcontractor shall preserve his weekly payroll records for a period of three years from date of completion of the contract. The payroll records shall set out accurately and completely the name and address of each laborer and mechanic, his correct classification, rate of pay, daily and weekly number of hours worked, deductions made, and actual wages paid. Such payroll records shall be made available at all times for inspection by the contracting officer or his authorized representative, and by authorized representatives of the Department of Labor. (Reporting and recordkeeping requirements in paragraph (b) have been approved by the Office of Management and Budget under control number 1215-0017)

[29 FR 97, Jan. 4, 1964, as amended at 47 FR 145, Jan. 5, 1982]

## **29 CFR 3.5 - Payroll deductions permissible without application to or approval of the Secretary of Labor.**

Deductions made under the circumstances or in the situations described in the paragraphs of this section may be made without application to and approval of the Secretary of Labor:

(a) Any deduction made in compliance with the requirements of Federal, State, or local law, such as Federal or State withholding income taxes and Federal social security taxes.

(b) Any deduction of sums previously paid to the employee as a bona fide prepayment of wages when such prepayment is made without discount or interest. A bona fide prepayment of wages is considered to have been made only when cash or its equivalent has been advanced to the person employed in such manner as to give him complete freedom of disposition of the advanced funds.

(c) Any deduction of amounts required by court process to be paid to another, unless the deduction is in favor of the contractor, subcontractor, or any affiliated person, or when collusion or collaboration exists.

(d) Any deduction constituting a contribution on behalf of the person employed to funds established by the employer or representatives of employees, or both, for the purpose of providing either from principal or income, or both, medical or hospital care, pensions or annuities on retirement, death benefits, compensation for injuries, illness, accidents, sickness, or disability, or for insurance to provide any of the foregoing, or unemployment benefits, vacation pay, savings accounts, or similar payments for the benefit of employees, their families and dependents: Provided, however, That the following standards are met:

(1) The deduction is not otherwise prohibited by law;

(2) It is either:

(i) Voluntarily consented to by the employee in writing and in advance of the period in which the work is to be done and such consent is not a condition either for the obtaining of or for the continuation of employment, or

(ii) provided for in a bona fide collective bargaining agreement between the contractor or subcontractor and representatives of its employees;

(3) No profit or other benefit is otherwise obtained, directly or indirectly, by the contractor or subcontractor or any affiliated person in the form of commission, dividend, or otherwise; and

(4) The deductions shall serve the convenience and interest of the employee.

(e) Any deduction contributing toward the purchase of United States Defense Stamps and Bonds when voluntarily authorized by the employee.

- (f) Any deduction requested by the employee to enable him to repay loans to or to purchase shares in credit unions organized and operated in accordance with Federal and State credit union statutes.
- (g) Any deduction voluntarily authorized by the employee for the making of contributions to governmental or quasi-governmental agencies, such as the American Red Cross.
- (h) Any deduction voluntarily authorized by the employee for the making of contributions to Community Chests, United Givers Funds, and similar charitable organizations.
- (i) Any deductions to pay regular union initiation fees and membership dues, not including fines or special assessments: Provided, however, That a collective bargaining agreement between the contractor or subcontractor and representatives of its employees provides for such deductions and the deductions are not otherwise prohibited by law.
- (j) Any deduction not more than for the "reasonable cost" of board, lodging, or other facilities meeting the requirements of section 3(m) of the Fair Labor Standards Act of 1938, as amended, and part 531 of this title. When such a deduction is made the additional records required under Sec. 516.25(a) of this title shall be kept.
- (k) Any deduction for the cost of safety equipment of nominal value purchased by the employee as his own property for his personal protection in his work, such as safety shoes, safety glasses, safety gloves, and hard hats, if such equipment is not required by law to be furnished by the employer, if such deduction is not violative of the Fair Labor Standards Act or prohibited by other law, if the cost on which the deduction is based does not exceed the actual cost to the employer where the equipment is purchased from him and does not include any direct or indirect monetary return to the employer where the equipment is purchased from a third person, and if the deduction is either
  - (1) Voluntarily consented to by the employee in writing and in advance of the period in which the work is to be done and such consent is not a condition either for the obtaining of employment or its continuance; or
  - (2) Provided for in a bona fide collective bargaining agreement between the contractor or subcontractor and representatives of its employees.

[29 FR 97, Jan. 4, 1964, as amended at 36 FR 9770, May 28, 1971]

### **29 CFR 3.6 - Payroll deductions permissible with the approval of the Secretary of Labor.**

Any contractor or subcontractor may apply to the Secretary of Labor for permission to make any deduction not permitted under Sec. 3.5. The Secretary may grant permission whenever he finds that:

- (a) The contractor, subcontractor, or any affiliated person does not make a profit or benefit directly or indirectly from the deduction either in the form of a commission, dividend, or otherwise;
- (b) The deduction is not otherwise prohibited by law;
- (c) The deduction is either (1) voluntarily consented to by the employee in writing and in advance of the period in which the work is to be done and such consent is not a condition either for the obtaining of employment or its continuance, or (2) provided for in a bona fide collective bargaining agreement between the contractor or subcontractor and representatives of its employees; and
- (d) The deduction serves the convenience and interest of the employee.

### **29 CFR 3.7 - Applications for the approval of the Secretary of Labor.**

Any application for the making of payroll deductions under Sec. 3.6 shall comply with the requirements prescribed in the following paragraphs of this section:

- (a) The application shall be in writing and shall be addressed to the Secretary of Labor.
- (b) The application need not identify the contract or contracts under which the work in question is to be performed. Permission will be given for deductions on all current and future contracts of the applicant for a period of 1 year. A renewal of permission to make such payroll deduction will be granted upon the submission of an application which makes reference to the original application, recites the date of the Secretary of Labor's approval of such deductions, states affirmatively that there is continued compliance with the standards set forth in the provisions of Sec. 3.6, and specifies any conditions which have changed in regard to the payroll deductions.

(c) The application shall state affirmatively that there is compliance with the standards set forth in the provisions of Sec. 3.6. The affirmation shall be accompanied by a full statement of the facts indicating such compliance.

(d) The application shall include a description of the proposed deduction, the purpose to be served thereby, and the classes of laborers or mechanics from whose wages the proposed deduction would be made.

(e) The application shall state the name and business of any third person to whom any funds obtained from the proposed deductions are to be transmitted and the affiliation of such person, if any, with the applicant.

[29 FR 97, Jan. 4, 1964, as amended at 36 FR 9771, May 28, 1971]

### **29 CFR 3.8 - Action by the Secretary of Labor upon applications.**

The Secretary of Labor shall decide whether or not the requested deduction is permissible under provisions of Sec. 3.6; and shall notify the applicant in writing of his decision.

### **29 CFR 3.9 - Prohibited payroll deductions.**

Deductions not elsewhere provided for by this part and which are not found to be permissible under Sec. 3.6 are prohibited.

### **29 CFR 3.10 - Methods of payment of wages.**

The payment of wages shall be by cash, negotiable instruments payable on demand, or the additional forms of compensation for which deductions are permissible under this part. No other methods of payment shall be recognized on work subject to the Copeland Act.

### **29 CFR 3.11 - Regulations part of contract.**

All contracts made with respect to the construction, prosecution, completion, or repair of any public building or public work or building or work financed in whole or in part by loans or grants from the United States covered by the regulations in this part shall expressly bind the contractor or subcontractor to comply with such of the regulations in this part as may be applicable. In this regard, see Sec. 5.5(a) of this subtitle.





U.S. Department of Housing  
and Urban Development

Labor Relations Desk Guide  
LR01.DG

# DAVIS-BACON

## LABOR STANDARDS

*A Contractor's Guide  
to Prevailing Wage Requirements  
for Federally-Assisted Construction Projects*

*January 2012  
Previous versions obsolete*



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## INTRODUCTION

This Guide has been prepared for you as a contractor performing work on construction projects that are assisted by the Department of Housing and Urban Development and subject to Davis-Bacon prevailing wage requirements. This Guide does not address contractor requirements involved in direct Federal contracting where HUD or another Federal agency enters into a procurement contract. In this latter case, the Federal Acquisition Regulations (FAR) are applicable. While the guidance contained in this Guide is generally applicable to any Davis-Bacon covered project, specific questions pertaining to direct Federal contracts should be addressed to the Contracting Officer who signed the contract for the Federal agency.

Our objective here is to provide you with a guide which is simple and non-bureaucratic yet comprehensive and which will help you better understand and comply with Davis-Bacon labor standards. HUD's Office of Labor Relations worked closely with the Department of Labor's Wage and Hour Division to make sure that the labor standards provisions in your contract and the specifics of complying with them represent the latest information. It is the Department of Labor which has general administrative oversight of all Federal contracting agencies, such as HUD, which administer the day-to-day responsibilities of enforcing Davis-Bacon provisions in construction contracts they either fund or assist in funding.

There are three chapters in this Guide. The first chapter offers a brief description of the laws and regulations associated with Federal labor standards administration and enforcement and discusses both what's in your contract that requires Davis-Bacon compliance and your responsibilities. The second chapter deals with labor standards and payroll reporting requirements. The third chapter discusses what can happen in the event there is a dispute about the wage rates that should be (or have been) paid and any back wages that may be due.

Finally, not all HUD construction projects are covered by Davis-Bacon wage rates. For the purpose of this Guide, we are assuming that a determination has already been made that Davis-Bacon wage rates are applicable. Should you wish assistance in determining whether Davis-Bacon wage rates apply to a particular project or if you need other related technical assistance, please consult with the HUD Labor Relations Field staff for your area. If you don't know which staff to contact, a list of Labor Relations field offices and their geographic areas and telephone numbers can be found on HUD's Home Page at the address below.

**Visit the Office of Labor Relations on-line:**

**<http://www.hud.gov/offices/olr>**

Obtain additional copies of this Guide and other publications at our website or by telephone from HUD's Customer Service Center at (800)767-7468.



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## CHAPTER 1      LAWS, REGULATIONS, CONTRACTS AND RESPONSIBILITIES

The following paragraphs describe what the labor standards laws and regulations actually say and what they mean to you on HUD projects:

### 1-1      DAVIS-BACON AND OTHER LABOR LAWS.

- a. **The Davis-Bacon Act (DBA).** The Davis-Bacon Act requires the payment of prevailing wage rates (which are determined by the U.S. Department of Labor) to all laborers and mechanics on Federal government and District of Columbia construction projects in excess of \$2,000. Construction includes alteration and/or repair, including painting and decorating, of public buildings or public works.

Most HUD construction work is not covered by the DBA itself since HUD seldom contracts directly for construction services. Most often, if Davis-Bacon wage rates apply to a HUD project it is because of a labor provision contained in one of HUD's "Related Acts" such as the U. S. Housing Act of 1937, the National Housing Act, the Housing and Community Development Act of 1974, the National Affordable Housing Act of 1990, and the Native American Housing Assistance and Self-Determination Act of 1996. The Related Acts are often referred to as the Davis-Bacon and Related Acts or DBRA.

- b. **The Contract Work Hours and Safety Standards Act (CWHSSA).** CWHSSA requires time and one-half pay for overtime (O/T) hours (over 40 in any workweek) worked on the covered project. The CWHSSA applies to both direct Federal contracts and to indirect Federally-assisted contracts **except** where the assistance is solely in the nature of a loan guarantee or insurance. CWHSSA violations carry a liquidated damages penalty (\$10/day per violation). Intentional violations of CWHSSA standards can be considered for Federal criminal prosecution.

CWHSSA does not apply to prime contracts of \$100,000 or less. In addition, some HUD projects are not covered by CWHSSA because some HUD programs only provide loan guarantees or insurance. CWHSSA also does not apply to construction or rehabilitation contracts that are not subject to Federal prevailing wage rates (e.g., Davis-Bacon wage rates, or HUD-determined rates for operation of public housing and Indian block grant-assisted housing). However, even though CWHSSA overtime pay is not required, Fair Labor Standards Act (FLSA) overtime pay is probably still applicable. (See also Labor Relations Letter SL-95-01, CWHSSA Coverage threshold for overtime and health and safety provision, available on-line at the HUD Labor Relations Library at: [www.hud.gov/offices/olr/library.cfm](http://www.hud.gov/offices/olr/library.cfm))

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- c. **The Copeland Act (Anti-Kickback Act)**. The Copeland Act makes it a Federal crime for anyone to require any laborer or mechanic (employed on a Federal or Federally-assisted project) to kickback (i.e., give up or pay back) any part of their wages. The Copeland Act requires every employer (contractors and subcontractors) to submit weekly certified payroll reports (CPRs) and regulates permissible payroll deductions.
  - d. **The Fair Labor Standards Act (FLSA)**. The FLSA contains Federal minimum wage rates, overtime (O/T), and child labor requirements. These requirements generally apply to any labor performed. The DOL has the authority to administer and enforce FLSA. HUD will refer to the DOL any possible FLSA violations that are found on HUD projects.

## 1-2 **DAVIS-BACON REGULATIONS.**

The Department of Labor (DOL) has published rules and instructions concerning Davis-Bacon and other labor laws in the Code of Federal Regulations (CFR). These regulations can be found in ***Title 29 CFR Parts 1, 3, 5, 6 and 7***. Part 1 explains how the DOL establishes and publishes DBA wage determinations (aka wage decisions) and provides instructions on how to use the determinations. Part 3 describes Copeland Act requirements for payroll deductions and the submission of weekly certified payroll reports. Part 5 covers the labor standards provisions that are in your contract relating to Davis-Bacon Act wage rates and the responsibilities of contractors and contracting agencies to administer and enforce the provisions. Part 6 provides for administrative proceedings enforcing Federal labor standards on construction and service contracts. Last, Part 7 sets parameters for practice before the Administrative Review Board. These regulations are used as the basis for administering and enforcing the laws.

DOL Regulations are available on-line on the World Wide Web:  
[http://www.dol.gov/dol/allcfr/Title\\_29.htm](http://www.dol.gov/dol/allcfr/Title_29.htm)

## 1-3 **CONSTRUCTION CONTRACT PROVISIONS**

Each contract subject to Davis-Bacon labor standards requirements must contain labor standards clauses and a Davis-Bacon wage decision. These documents are normally bound into the contract specifications.

- a. The labor standards clauses. The labor standards clauses describe the responsibilities of the contractor concerning Davis-Bacon wages and obligate the contractor to comply with the labor requirements. The labor standards clauses also provide for remedies in the event of violations, including withholding from payments due to the contractor to ensure the payment of wages or liquidated damages which may be found due. These contract clauses enable the contract administrator to enforce the Federal labor standards applicable to the project. HUD has standard forms that contain contract clauses. For example, the HUD-2554, Supplementary Conditions to the Contract for Construction, which is issued primarily for FHA multifamily housing and other construction projects

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administered by HUD; the HUD-4010, Federal Labor Standards Provisions, which is used for CDBG and HOME projects, and the HUD-5370, General Conditions of the Contract for Construction or the HUD-5370-EZ (construction contracts ≤\$100,000) which are used for Public and Indian Housing projects.

HUD program labor standards forms are available on-line at:  
[www.hud.gov/offices/adm/hudclips/index.cfm](http://www.hud.gov/offices/adm/hudclips/index.cfm)

- b. **Davis-Bacon Wage Decisions.** The Davis-Bacon wage decision (or wage determination) is a listing of various construction work classifications, such as Carpenter, Electrician, Plumber and Laborer, and the minimum wage rates (and fringe benefits, where prevailing) that people performing work in those classifications must be paid.

Davis-Bacon wage decisions are established by the DOL for various types of construction (e.g., residential, heavy, highway) and apply to specific geographic areas, usually a county or group of counties. Wage decisions are modified from time to time to keep them current. In most cases, when the contract is awarded or when construction begins, the wage decision is “locked-in” and no future modifications are applicable to the contract or project involved.

All current Davis-Bacon wage decisions can be accessed on-line at no cost at:  
<http://www.wdol.gov>

#### **1-4 RESPONSIBILITY OF THE PRINCIPAL CONTRACTOR**

The principal contractor (also referred to as the *prime or general contractor*) is responsible for the full compliance of all employers (the contractor, subcontractors and any lower-tier subcontractors) with the labor standards provisions applicable to the project. Because of the contractual relationship between a prime contractor and his/her subcontractors, subcontractors generally should communicate with the contract administrator only through the prime contractor. (See Contract Administrator, below.)

To make this Guide easier to understand, the term “prime contractor” will mean the principal contractor; “subcontractor” will mean all subcontractors including lower-tier subcontractors; and the term “employer” will mean all contractors as a group, including the prime contractor and any subcontractors and lower-tier subcontractors.

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## 1-5 RESPONSIBILITY OF THE CONTRACT ADMINISTRATOR.

The **contract administrator** is responsible for the proper administration and enforcement of the Federal labor standards provisions on contracts covered by Davis-Bacon requirements. We use this term to represent the person (or persons) who will provide labor standards advice and support to you and other project principals (e.g., the owner, sponsor, architect), including providing the proper Davis-Bacon wage decision (see 2-1, **The Wage Decision**) and ensuring that the wage decision and contract clauses are incorporated into the contract for construction. The contract administrator also monitors labor standards compliance (see 2-6, **Compliance Reviews**) by conducting interviews with construction workers at the job site and reviewing payroll reports, and oversees any enforcement actions that may be required.

The contract administrator could be an employee or agent of HUD, or of a city or county or public housing agency. For HUD projects administered directly by HUD staff, usually FHA-insured multifamily projects, the contract administrator will be the HUD Labor Relations field staff. But many HUD-assisted projects are administered by local contracting agencies such as Public Housing Agencies (PHAs), Indian tribes and tribally-designated housing entities (TDHEs), and States, cities and counties under HUD's Community Development Block Grant (CDBG) and HOME programs. In these cases, the contract administrator will likely be local agency staff. In either case, the guidance for you remains essentially the same.

The DOL also has a role in monitoring Davis-Bacon administration and enforcement. In addition, DOL has independent authority to conduct investigations. A DOL investigator or other DOL representative may visit Davis-Bacon construction sites to interview construction workers or review payroll information.

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## CHAPTER 2      HOW TO COMPLY WITH LABOR STANDARDS AND PAYROLL REPORTING REQUIREMENTS

**WHERE TO START?**      Now that you know you're on a Davis-Bacon project and you know some of the legal and practical implications, what's next?

### SECTION I - THE BASICS

#### 2-1    **THE WAGE DECISION.**

Davis-Bacon labor standards stipulate the wage payment requirements for Carpenters, Electricians, Plumbers, Roofers, Laborers, and other construction work classifications that may be needed for the project. The Davis-Bacon wage decision that applies to the project contains a schedule of work classifications and wage rates that must be followed. If you don't have it already (and by now you should), you'll want to get a copy of the applicable Davis-Bacon wage decision.

Remember, the wage decision is contained in the contract specifications along with the labor standards clauses. See 1-3, Construction Contract Provisions.

- a. **The work classifications and wage rates.** A Davis-Bacon wage decision is simply a listing of different work classifications and the minimum wage rates that must be paid to anyone performing work in those classifications. You'll want to make sure that the work classification(s) you need are contained in the wage decision and make certain you know exactly what wage rate(s) you will need to pay. Some wage decisions cover several counties and/or types of construction work (for example, residential and commercial work) and can be lengthy and difficult to read. Contact the contract administrator (HUD Labor Relations field staff or local agency staff) if you have any trouble reading the wage decision or finding the work classification(s) you need.

To make reading lengthy wage decisions easier for you, the contract administrator may prepare a Project Wage Rate Sheet (HUD-4720). This Sheet is a one-page transcript that will show only the classifications and wage rates for a particular project. A blank copy of a Project Wage Rate Sheet is provided for you in the appendix. Also, a fillable version of this form is available on-line at HUDClips (see web address in the Appendix). Contact the contract administrator monitoring your project for assistance with a Project Wage Rate Sheet.

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- b. **Posting the wage decision.** If you are the prime contractor, you will be responsible for posting a copy of the wage decision (or the Project Wage Rate Sheet) and a copy of the DOL Davis-Bacon poster titled Employee Rights under the Davis-Bacon Act (Form WH-1321) at the job site in a place that is easily accessible to all of the construction workers employed at the project and where the wage decision and poster won't be destroyed by wind or rain, etc. The Employee Rights under the Davis-Bacon Act poster is available in English and Spanish on-line at HUDClips (see address in the Appendix).

The Employee Rights under the Davis-Bacon Act poster (WH-1321) replaces the Notice to all Employees. The new poster is available in English and Spanish on-line at HUDClips (see address in the Appendix).

## 2-2 **ADDITIONAL "TRADE" CLASSIFICATIONS AND WAGE RATES.**

What if the work classification you need isn't on the wage decision? If the work classification(s) that you need doesn't appear on the wage decision, you will need to request an additional classification and wage rate. This process is usually very simple and you'll want to start the request right away. Basically, you identify the classification you need and recommend a wage rate for DOL to approve for the project. There are a few rules about additional classifications; you'll find these rules in the DOL regulations, Part 5, and in the labor clauses in your contract. The rules are summarized for you here:

- a. **Additional classification rules.** Additional classifications and wage rates can be approved if:
1. The requested classification is used by construction contractors in the area of the project. (The area is usually defined as the county where the project is located).
  2. The work that will be performed by the requested classification is not already performed by another classification that is already on the wage decision. (In other words, if there already is an Electrician classification and wage rate on the wage decision you can't request another Electrician classification and rate.)
  3. The proposed wage rate for the requested classification "fits" with the other wage rates already on the wage decision. (For example, the wage rate proposed for a trade classification such as Electrician must be at least as much as the lowest wage rate for other trade classifications already contained in the wage decision.) And,
  4. The workers that will be employed in the added classification (if it is known who the workers are/will be), or the workers' representatives, must agree with the proposed wage rate.

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- b. **Making the request.** A request for additional classification and wage rate must be made in writing through the contract administrator. (If the contract administrator is a local agency, the agency will send the request to the HUD Labor Relations staff.) If you are a subcontractor, your request should also go through the prime contractor. All you need to do is identify the work classification that is missing and recommend a wage rate (usually the rate that employer is already paying to the employees performing the work) for that classification. You may also need to describe the work that the new classification will perform.
- c. **HUD review.** The HUD Labor Relations field staff will review the requested classification and wage rate to determine whether the request meets the DOL rules outlined in paragraph 2-2(a), above. If additional information or clarification is needed, the staff will contact the prime contractor (or contract administrator for local agency projects) for more information, etc. If the Labor Relations review finds that the request meets the rules, the staff will give preliminary approval on the request and refer it to the DOL for final approval. The staff will send to you a copy of the preliminary approval/referral letter to the DOL.

If the HUD Labor Relations staff doesn't think the request meets the rules and if agreement can't be reached on the proper classification or wage rate for the work described, the HUD Labor Relations staff will not approve the request. In this case, the staff will send your request to the DOL with an explanation why HUD believes that the request shouldn't be approved. The DOL still has final decision authority. You will receive a copy of the disapproval/referral letter to the DOL.

- d. **DOL decision.** The DOL will respond to HUD Labor Relations in writing about the additional classification and wage rate request. HUD Labor Relations will notify you of the DOL decision in writing. If the DOL approves the request, the prime contractor must post the approval notice on the job site with the wage decision.

If the DOL does not approve the request, you will be notified about what classification and wage rate should be used for the work in question. You will also receive instructions about how to ask for DOL reconsideration if you still want to try to get your recommendation approved.

It's always a good idea to talk to the contract administrator before submitting an additional classification and wage rate request. The contract administrator can offer suggestions and advice that may save you time and increase the likelihood that DOL will approve your request. Usually, the contract administrator can give you an idea about what the DOL will finally decide.

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## 2-3 CERTIFIED PAYROLL REPORTS.

You'll need to submit a weekly certified payroll report (CPR) beginning with the first week that your company works on the project and for every week afterward until your firm has completed its work. It's always a good idea to number the payroll reports beginning with #1 and to clearly mark your last payroll for the project "Final."

- a. **Payroll formats.** The easiest form to use is DOL's WH-347, Payroll. A sample copy of the WH-347 is included in the back of this Guide. You may access a fillable version of the WH-347 on-line at HUDClips (see web address in the Appendix). Also, the contract administrator can provide a few copies of the WH-347 that you can reproduce.

You are not required to use Payroll form WH-347. You are welcome to use any other type of payroll, such as computerized formats, as long as it contains all of the information that is required on the WH-347.

- b. **Payroll certifications.** The weekly payrolls are called certified because each payroll is signed and contains language certifying that the information is true and correct. The payroll certification language is on the reverse side of the WH-347. If you are using another type of payroll format you may attach the certification from the back of the WH-347, or any other format which contains the same certification language on the WH-347 (reverse).

DOL's website has Payroll Instructions and the Payroll form WH-347 in a "fillable" PDF format at this address:  
[www.dol.gov/whd/forms/wh347.pdf](http://www.dol.gov/whd/forms/wh347.pdf)

- c. **"No work" payrolls.** "No work" payrolls may be submitted whenever there is a temporary break in your work on the project, for example, if your firm is not needed on the project right now but you will be returning to the job in a couple of weeks. (See tip box, for "no work" payroll exemption!) However, if you know that your firm will not be working on the project for an extended period of time, you may wish to send a short note to the contract administrator to let them know about the break in work and to give an approximate date when your firm will return to the project. If you number payrolls consecutively or if you send a note, you do not need to send "no work" payrolls.

If you number your payroll reports consecutively, you do not need to submit "no work" payrolls!



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- d. **Payroll review and submission.** The prime contractor should review each subcontractor's payroll reports for compliance prior to submitting the reports to the contract administrator. Remember, the prime contractor is responsible for the full compliance of all subcontractors on the contract and will be held accountable for any wage restitution that may be found due to any laborer or mechanic that is underpaid and for any liquidated damages that may be assessed for overtime violations. All of the payroll reports for any project must be submitted to the contract administrator through the prime contractor.

An alert prime contractor that reviews subcontractor payroll submissions can detect any misunderstandings early, prevent costly underpayments and protect itself from financial loss should underpayments occur.

- e. **Payroll retention.** Every contractor (including every subcontractor) must keep a complete set of their own payrolls and other basic records such as employee addresses and full SSNs, time cards, tax records, evidence of fringe benefit payments, for a Davis-Bacon project for at least 3 years after the project is completed. The prime contractor must keep a complete set of all of the payrolls for every contractor (including subcontractors) for at least 3 years after completion of the project.
- f. **Payroll inspection.** In addition to submitting payrolls to the contract administrator, every contractor (including subcontractors) must make their own copy of the payrolls and other basic records available for review or copying to any authorized representative from HUD or from DOL.

## 2-4 **DAVIS-BACON DEFINITIONS.**

Before we discuss how to complete the weekly payroll forms, we need to review a couple of definitions. These definitions can help you understand what will be required of you:

- a. **Laborer or mechanic.** "Laborers" and "mechanics" mean anyone who is performing construction work on the project, including trade journeymen (carpenters, plumbers, sheet metal workers, etc.), apprentices, and trainees and, for CWHSSA purposes, watchmen and guards. "Laborers" and "mechanics" are the two groups of workers that must be paid not less than Davis-Bacon wage rates.
1. **Working foremen.** Foremen or supervisors that regularly spend more than 20% of their time performing construction work and do not meet the exclusions in paragraph 2 below are covered "laborers" and "mechanics" for labor standards purposes for the time spent performing construction work.
  2. **Exclusions.** People whose duties are primarily administrative, executive or clerical are not laborers or mechanics. Examples include superintendents, office staff, timekeepers, messengers, etc. (Contact the contract administrator if you have any questions about whether a particular employee is excluded.)

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- b. **Employee.** Every person who performs the work of a laborer or mechanic is “employed” regardless of any contractual relationship which may be alleged to exist between a contractor or subcontractor and such person. This means that even if there is a contract between a contractor and a worker, the contractor must make sure that the worker is paid at least as much as the wage rate on the wage decision for the classification of work they perform. Note that there are no exceptions to the prevailing wage requirements for relatives or for self-employed laborers and mechanics.

For more information about working subcontractors, ask the contract administrator or your HUD Labor Relations Field Staff for a copy of Labor Relations Letter LR-96-01, Labor standards compliance requirements for self-employed laborers and mechanics. Labor Relations Letters and other helpful Labor Relations publications are available at HUD’s Labor Relations web site (see the list of web site addresses in the Appendix).

- c. **Apprentices and trainees.** The only workers who can be paid less than the wage rate on the wage decision for their work classification are “apprentices” and “trainees” registered in approved apprenticeship or training programs. Approved programs are those which have been registered with the DOL or a DOL-recognized State Apprenticeship Council (SAC). Apprentices and trainees are paid wage rates in accordance with the wage schedule in the approved program.

Most often, the apprentice/trainee wage rate is expressed as a series of percentages tied to the amount of time spent in the program. For example, 0-6 months: 65%; 6 months - 1 year: 70%; etc. The percentage is applied to the journeyman’s wage rate. On Davis-Bacon projects, the percentage must be applied to the journeyman’s wage rate on the applicable wage decision for that craft.

1. **Probationary apprentice.** A “probationary apprentice” can be paid as an apprentice (less than the rate on the wage decision) if the DOL or SAC has certified that the person is eligible for probationary employment as an apprentice.
2. **Pre-apprentice.** A “pre-apprentice”, that is, someone who is not registered in a program and who hasn’t been DOL- or SAC-certified for probationary apprenticeship is not considered to be an “apprentice” and must be paid the full journeyman’s rate on the wage decision for the classification of work they perform.
3. **Ratio of apprentices and trainees to journeymen.** The maximum number of apprentices or trainees that you can use on the job site cannot exceed the ratio of apprentices or trainees to journeymen allowed in the approved program.

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- d. **Prevailing wages or wage rates.** Prevailing wage rates are the wage rates listed on the wage decision for the project. The wage decision will list a minimum basic hourly rate of pay for each work classification. Some wage decisions include fringe benefits which are usually listed as an hourly fringe rate. If the wage decision includes a fringe benefit rate for a classification, you will need to add the fringe benefit rate to the basic hourly rate unless you provide bona fide fringe benefits for your employees.
1. **Piece-work.** Some employees are hired on a piece-work basis, that is, the employee's earnings are determined by a factor of work produced. For example, a Drywall Hanger's earnings may be calculated based upon the square feet of sheetrock actually hung, a Painter's earnings may be based upon the number of units painted. Employers may calculate weekly earnings based upon piece rates provided the weekly earnings are sufficient to satisfy the wage rate requirement based upon actual hours, including any overtime, worked. Accurate time records must be maintained for any piece-work employees. If the weekly piece rate earnings are not sufficient, the employer must recompute weekly earnings based upon the actual hours worked and the rate on the wage decision for the work classification(s) involved.
- e. **Fringe benefits** Fringe benefits can include health insurance premiums, retirement contributions, life insurance, vacation and other paid leave as well as some contributions to training funds. Fringe benefits do not include employer payments or contributions required by other Federal, State or local laws, such as the employer's contribution to Social Security or some disability insurance payments.

Note that the total hourly wage rate paid to any laborer or mechanic (basic wage or basic wage plus fringe benefits) may be no less than the total wage rate (basic wage or basic wage plus fringe benefits) on the wage decision for their craft. If the value of the fringe benefit(s) you provide is less than the fringe benefit rate on the wage decision, you will need to add the balance of the wage decision fringe benefit rate to the basic rate paid to the employee. For example, if the wage decision requires \$10/hour basic rate plus \$5/hour fringe benefits, you must pay no less than that total (\$15/hour) in the basic rate or basic rate plus whatever fringe benefit you may provide. You can meet this obligation in several ways: you could pay the base wage and fringe benefits as stated in the wage decision, or you could pay \$15 in base wage with no fringe benefits, or you could pay \$12 basic plus \$3 fringe benefits. You can also off-set the amount of the base wage if you pay more in fringe benefits such as by paying or \$9 basic plus \$6 fringe benefits; as long as you meet the total amount. The amount of the base wage that you may off-set with fringe benefits is limited by certain IRS and FLSA requirements.

- f. **Overtime.** Overtime hours are defined as all hours worked on the contract in excess of 40 hours in any work week. Overtime hours must be paid at no less than one and one-half times the regular rate of basic pay plus the straight-time rate of any required fringe benefits.

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- g. **Deductions.** You may make payroll deductions as permitted by DOL Regulations 29 CFR Part 3. These regulations prohibit the employer from requiring employees to “kick-back” (i.e., give up) any of their earnings. Allowable deductions which do not require prior DOL permission include employee obligations for income taxes, Social Security payments, insurance premiums, retirement, savings accounts, and any other legally-permissible deduction authorized by the employee. Deductions may also be made for payments on judgments and other financial obligations legally imposed against the employee.

Referring, again, to our example above where the wage decision requiring a \$15 total wage obligation (\$10 basic wage plus \$5 fringe benefits) was met by paying \$9 base wage plus \$6 fringe benefits: Note that overtime rates must be based on one and one-half times the basic rate as stated on the wage decision. In the above example, the employer must pay for overtime: \$15/hr (\$9 basic + \$6 fringe) plus \$5 (one-half of \$10, the wage decision basic rate) for a total of \$20 per hour.

- h. **Proper designation of trade.** You must select a work classification on the wage decision for each worker based on the actual type of work he/she performed and you must pay each worker no less than the wage rate on the wage decision for that classification regardless of their level of skill. In other words, if someone is performing carpentry work on the project, they must be paid no less than the wage rate on the wage decision for Carpenters even if they aren't considered by you to be fully trained as a Carpenter. Remember, the only people who can be paid less than the rate for their craft are apprentices and trainees registered in approved programs.
1. **Split-classification.** If you have employees that perform work in more than one trade during a work week, you can pay the wage rates specified for each classification in which work was performed only if you maintain accurate time records showing the amount of time spent in each classification of work. If you do not maintain accurate time records, you must pay these employees the highest wage rate of all of the classifications of work performed.
- i. **Site of work.** The “site of work” is where the Davis-Bacon wage rates apply. Usually, this means the boundaries of the project. “Site of work” can also include other adjacent or virtually adjacent property used by a contractor or subcontractor in the construction of the project, like a fabrication site that is dedicated exclusively, or nearly so, to the project.

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## SECTION II - REPORTING REQUIREMENTS

### 2-5 COMPLETING A PAYROLL REPORT.

What information has to be reported on the payroll form? The weekly payroll form doesn't ask for any information that you don't already need to keep for wage payment and tax purposes. For example, you need to know each employee's name; his or her work classification (who is working for you and what do they do?), the hours worked during the week, his or her rate of pay, the gross amount earned (how much did they earn?), the amounts of any deductions for taxes, etc., and the net amount paid (how much should the paycheck be made out for?). No more information than you need to know in order to manage your work crew and make certain they are paid properly. And, certainly, no more information than you need to keep for IRS, Social Security and other tax and employment purposes.

For many contractors, the Weekly Certified Payroll is the only Davis-Bacon paperwork you need to submit!

You are required to submit certified payrolls to illustrate and document that you have complied with the prevailing wage requirements. The purpose of the contract administrator's review of your payrolls is to verify your compliance. Clearer and complete payroll reports will permit the contract administrator to complete reviews of your payroll reports quickly.

- a. **Project and contractor/subcontractor information.** Each payroll must identify the contractor or subcontractor's name and address, the project name and number, and the week ending date. Indicate the week dates in the spaces provided. Numbering payrolls is optional but strongly recommended.
- b. **Employee information.** Effective January 18, 2009, payrolls shall not report employee addresses or full Social Security Numbers (SSNs). Instead, the first payroll on which each employee appears shall include the employee's name and an individually identifying number, usually the last 4 digits of the employee's SSN. Afterward, the identifying number does not need to be reported unless it is necessary to distinguish between employees, e.g., if two employees have the same name.

Employers (prime contractors and subcontractors) must maintain the current address and full SSN for each employee and must provide this information upon request to the contracting agency or other authorized representative responsible for federal labor standards compliance monitoring. Prime contractors may require a subcontractor(s) to provide this information for the prime contractor's records. DOL has modified form WH-347, Payroll, to accommodate these reporting requirements.

- c. **Work classification.** Each employee must be classified in accordance with the wage decision based on the type of work they actually perform.

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1. **Apprentices or trainees.** The first payroll on which any apprentice or trainee appears must be accompanied by a copy of that apprentice's or trainee's registration in a registered or approved program. A copy of the portions of the registered or approved program pertaining to the wage rates and ratios shall also accompany the first payroll on which the first apprentice or trainee appears.
  2. **Split classifications.** For an employee that worked in a split classification, make a separate entry for each classification of work performed distributing the hours of work to each classification, accordingly, and reflecting the rate of pay and gross earnings for each classification. Deductions and net pay may be based upon the total gross amount earned for all classifications.
- d. **Hours worked.** The payroll should show ONLY the regular and overtime hours worked on this project. Show both the daily and total weekly hours for each employee. If an employee performs work at job sites other than the project for which the payroll is prepared, those "other job" hours should not be reported on the payroll. In these cases, you should list the employee's name, classification, hours for this project only, the rate of pay and gross earnings for this project, and the gross earned for all projects. Deductions and net pay may be based upon the employee's total earnings (for all projects) for the week.
- e. **Rate of pay.** Show the basic hourly rate of pay for each employee for this project. If the wage decision includes a fringe benefit and you do not participate in approved fringe benefit programs, add the fringe benefit rate to the basic hourly rate of pay. Also list the overtime rate if overtime hours were worked.
1. **Piece-work.** For any piece-work employees, the employer must compute an effective hourly rate for each employee each week based upon the employee's piece-work earnings for that week. To compute the effective hourly rate, divide the piece-work earnings by the total number of hours worked, including consideration for any overtime hours.

The effective hourly rate must be reflected on the certified payroll and this hourly rate may be no less than the wage rate (including fringe benefits, if any) on the wage decision for the classification of work performed. It does not matter that the effective hourly rate changes from week-to-week, only that the rate is no less than the rate on the wage decision for the classification of work performed.

Remember, the overtime rate is computed at one and one-half times the basic rate of pay plus any fringe benefits. For example, if the wage decision requires \$10/hour basic plus \$5/hour fringe benefits, the overtime rate would be:  $(\$10 \times 1 \frac{1}{2}) + \$5 = \$20/\text{hour}$ .

- f. **Gross wages earned.** Show the gross amount of wages earned for work performed on this project. Note: For employees with work hours and earnings on other projects, you may show gross wages for this project over gross earnings all projects (for example, \$425.40/\$764.85) and base deductions and net pay on the "all projects" earnings.

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- g. **Deductions.** Show the amounts of any deductions from the gross earnings. “Other” deductions should be identified (for example, Savings Account or Loan Repayment). Any voluntary deduction (that is, not required by law or by an order of a proper authority) must be authorized in writing by the employee or provided for in a collective bargaining (union) agreement. A short note signed by the employee is all that is needed and should accompany the first payroll on which the other deduction appears.

Only one employee authorization is needed for recurring (e.g., weekly) other deductions. Written employee authorization is not required for income tax and Social Security deductions.

- h. **Net pay.** Show the net amount of wages paid.
- i. **Statement of compliance.** The Statement of Compliance is the certification. It is located on the reverse side of a standard payroll form (WH-347). Be sure to complete the identifying information at the top, particularly if you are attaching the Statement of Compliance to an alternate payroll form such as a computer payroll. Also, you must check either 4(a) or 4(b) if the wage decision contains a fringe benefit. Checking 4(a) indicates that you are paying required fringe benefits to approved plans or programs; and 4(b) indicates that you are paying any required fringe benefit amounts directly to the employee by adding the fringe benefit rate to the basic hourly rate of pay. If you are paying a portion of the required fringe benefit to programs and the balance directly to the employee, explain those differences in box 4(c).

Only one Statement of Compliance is required for each employer’s weekly payroll no matter how many pages are needed to report the employee data.

- j. **Signature.** Make sure the payroll is signed with an original signature in ink. The payroll must be signed by a principal of the firm (owner or officer such as the president, treasurer or payroll administrator) or by an authorized agent (a person authorized by a principal in writing to sign the payroll reports). Signature authorization (for persons other than a principal) should be submitted with the first payroll signed by such an agent. Signatures in pencil; signature stamps; xerox, pdf and other facsimiles are not acceptable.

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## SECTION III - PAYROLL REVIEWS AND CORRECTIONS

### 2-6 COMPLIANCE REVIEWS.

The contract administrator or other inspector may visit the project site and interview some of the workers concerning their employment on the project. The DOL may also independently conduct its own reviews (see 1-5). In addition, the contract administrator will periodically review payrolls and related submissions, comparing the interview information to the payrolls, to ensure that the labor standards requirements have been met. You will be notified by the contract administrator if these reviews find any discrepancies or errors. You will be given instructions about what steps must be taken to correct any problems.

- a. **On-site interviews.** Every employer (contractor, subcontractor, etc.) must make their employees available for interview at the job site with the contract administrator or other agency representative, or HUD or DOL representative. The interviews are confidential and the employee will be asked about the kind of work they perform and their rate of pay. Every effort will be made to ensure that these interviews cause as little disruption as possible to the on-going work. The interviewer will record the interview information, usually on a form HUD-11, Record of Employee Interview, and forward the interviews to the contract administrator.
- b. **Project payroll reviews.** The contract administrator will compare the information on the interview forms to the corresponding payrolls to ensure that the workers are properly listed on the payrolls for the days and hours worked on the job site, work classification and rate of pay. The contract administrator will also review the payroll submissions to make certain that the payrolls are complete and signed; that employees are paid no less than the wage rate for the work classification shown; apprentice and trainee certifications are submitted (where needed); employee or other authorizations for other deductions are submitted (where needed); etc.

### 2-7 TYPICAL PAYROLL ERRORS AND REQUIRED CORRECTIONS.

The following paragraphs describe common payroll errors and the corrective steps you must take.

- a. **Inadequate payroll information.** If an alternate payroll format used by an employer (such as some computer payrolls) is inadequate, e.g., does not contain all of the necessary information that would be on the optional form WH-347, the employer will be asked to resubmit the payrolls on an acceptable form.
- b. **Missing identification numbers.** If the first payroll on which an employee appears does not contain the employee's individually identifying number, the employer will be asked to supply the missing information. This information can be reported on the next payroll submitted by the employer if the employer is still working on the project. Otherwise, the employer will be asked to submit a correction certified payroll.



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- c. **Incomplete payrolls.** If the information on the payroll is not complete, for example, if work classifications or rates of pay are missing, the employer will be asked to send a correction certified payroll.
- d. **Classifications.** If the payrolls show work classifications that do not appear on the wage decision, the employer will be asked to reclassify the employees in accordance with the wage decision or the employer may request an additional classification and wage rate (see 2-2). If reclassification results in underpayment (i.e., the wage rate reported on the payroll is less than the rate required for the new classification), the employer will be asked to pay wage restitution to all affected reclassified employees. (see 2-8 for instructions about wage restitution.)
- e. **Wage rates.** If the wage rates on the payroll are less than the wage rates on the wage decision for the work classifications reported, the employer will be asked to pay wage restitution to all affected employees.
- f. **Apprentices and trainees.** If a copy of the employee's registration or the approved program ratio and wage schedule are not submitted with the first payroll on which an apprentice or trainee appears, the employer will be asked to submit a copy of each apprentice's or trainee's registration and/or the approved program ratio and wage schedule. If the ratio of apprentices or trainees to journeymen on the payroll is greater than the ratio in the approved program, the employer will be asked to pay wage restitution to any excess apprentices or trainees. Also, any apprentice or trainee that is not registered in an approved program must receive the journeyman's wage rate for the classification of work they performed.
- g. **Overtime.** If the employees did not receive at least time and one-half for any overtime hours worked on the project, the following will occur:
1. If the project is subject to CWHSSA overtime requirements, the employer will be asked to pay wage restitution for all overtime hours worked on the project. The employer may also be liable to the United States for liquidated damages computed at \$10 per day per violation. Or,
  2. If the project is not subject to CWHSSA, the employer will be notified of the possible FLSA overtime violations. Also, the contract administrator may refer the matter to the DOL for further review.
- h. **Computations.** If the payroll computations (hours worked times rate of pay) or extensions (deductions, net pay) show frequent errors, the employer will be asked to take greater care. Wage restitution may be required if underpayments resulted from the errors.
- i. **Deductions.** If there are any "Other" deductions that are not identified, or if employee authorization isn't provided, or if there is any unusual (very high, or large number) deduction activity, the employer will be asked to identify the deductions, provide employee authorization or explain unusual deductions, as necessary.

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HUD does not enforce or attempt to provide advice on employer obligations to make deductions from employee earnings for taxes or Social Security. However, HUD may refer to the IRS or other responsible agency copies of certified payroll reports that show wages paid in gross amounts (i.e., without tax deduction) for its review and appropriate action.

- j. **Fringe benefits.** If the wage decision contains fringe benefits but the payroll does not indicate how fringe benefits were paid [neither 4(a) nor 4(b) is marked on the Statement of Compliance], the employer may be asked to submit correction certified payrolls and will be required to pay wage restitution if underpayments occurred. However, if the basic hourly rates for the employees are at least as much as the total wage rate on the wage decision (basic hourly rate plus the fringe benefit rate), no correction is necessary.
- k. **Signature.** If the payroll Statement of Compliance is not signed or is missing, the employer will be asked to submit a signed Statement of Compliance for each payroll affected. If the Statement of Compliance is signed by a person who is not a principle of the firm and that person has not been authorized by principle to sign, the employer will be asked to provide an authorization or to resubmit the Statement(s) of Compliance bearing the signature of a principle or other authorized signatory.
- l. **On-site interview comparisons.** If the comparison of on-site interviews to the payrolls indicates any discrepancies (for example, the employee does not appear on the payroll for the date of the interview), the employer will be asked to submit a correction certified payroll report.
- m. **Correction certified payroll.** Any and all changes to data on a submitted payroll report must be reported on a certified correction payroll. In no case will a payroll report be returned to the prime contractor or employer for revision.

## 2-8 **RESTITUTION FOR UNDERPAYMENT OF WAGES.**

Where underpayments of wages have occurred, the employer will be required to pay wage restitution to the affected employees. Wage restitution must be paid promptly in the full amounts due, less permissible and authorized deductions. All wages paid to laborers and mechanics for work performed on the project, including wage restitution, must be reported on a certified payroll report.

- a. **Notification** to the Employer/Prime contractor. The contract administrator will notify the employer and/or prime contractor in writing of any underpayments that are found during payroll or other reviews. The contract administrator will describe the underpayments and provide instructions for computing and documenting the restitution to be paid. The employer/prime contractor is allowed 30 days to correct the underpayments. Note that the prime contractor is responsible to the contract administrator for ensuring that restitution is paid. If the employer is a subcontractor, the subcontractor will usually make the computations and restitution payments and furnish the required documentation through the prime contractor.

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The contract administrator may communicate directly with a subcontractor when the underpayments are plainly evident and the subcontractor is cooperative. It is best to work through the prime contractor when the issues are complex, when there are significant underpayments and/or the subcontractor is not cooperative. In all cases, the subcontractor must ensure that the prime contractor receives a copy of the required corrective documentation.

- b. **Computing wage restitution.** Wage restitution is simply the difference between the wage rate paid to each affected employee and the wage rate required on the wage decision for all hours worked where underpayments occurred. The difference in the wage rates is called the adjustment rate. The adjustment rate times the number of hours involved equals the gross amount of restitution due. You may also compute wage restitution by calculating the total amount of Davis-Bacon wages earned and subtracting the total amount of wages paid. The difference is the amount of back wages due.
- c. **Correction certified payrolls.** The employer will be required to report the restitution paid on a correction certified payroll. The correction payroll will reflect the period of time for which restitution is due (for example, Payrolls #1 through #6; or a beginning date and ending date). The correction payroll will list each employee to whom restitution is due and their work classification; the total number of work hours involved (daily hours are usually not applicable for wage restitution); the adjustment wage rate (the difference between the required wage rate and the wage rate paid); the gross amount of restitution due; deductions and the net amount actually paid. A properly signed Statement of Compliance must accompany the correction payroll.

HUD no longer requires the signature of the employee on the correction payroll to evidence employee receipt of restitution payment. In addition, except in the most extraordinary cases, HUD no longer requires employers to submit copies of restitution checks (certified, cashiers, canceled or other), or employee-signed receipts or waivers.

- d. **Review of correction CPR.** The contract administrator will review the correction certified payroll to ensure that full restitution was paid. The prime contractor shall be notified in writing of any discrepancies and will be required to make additional payments, if needed, documented on a correction certified payroll within 30 days.
- e. **Unfound workers.** Sometimes, wage restitution cannot be paid to an affected employee because, for example, the employee has moved and can't be located. After wage restitution has been paid to all of the workers who could be located, the employer must submit a list of any workers who could not be found and paid (i.e., unfound workers) providing their names, Social Security Numbers, last known addresses and the gross amount due. In such cases, at the end of the project the prime contractor will be required

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to place in a deposit or escrow account an amount equal to the total gross amount of restitution that could not be paid because the employee(s) could not be located. The contract administrator will continue attempts to locate the unfound workers for 3 years after the completion of the project. After 3 years, any amount remaining in the account for unfound workers will be credited and/or forwarded by the contract administrator to HUD.

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## CHAPTER 3      LABOR STANDARDS DISPUTES, ADMINISTRATIVE REVIEWS, WITHHOLDING, DEPOSITS AND ESCROW ACCOUNTS, AND SANCTIONS

### WHAT HAPPENS WHEN THINGS GO WRONG?

#### 3-1      INTRODUCTION.

Even in the best of circumstances, things can go wrong. In a Davis-Bacon context, “things going wrong” usually means there’s a difference of opinion or a dispute about whether and to what extent underpayments have occurred. These disputes are usually between the contract administrator and one or more employers (the prime contractor and/or a subcontractor). The dispute may involve something simple such as an additional classification request that is pending before the DOL; or something as significant as investigative findings following a complaint of underpayment. This chapter discusses some of what you may expect and what you can do to make your views known and to lessen any delays in resolving the problem or issue.

#### 3-2      ADMINISTRATIVE REVIEW ON LABOR STANDARDS DISPUTES.

As mentioned in the Introduction above, a dispute about labor standards and compliance can arise for a number of reasons. The labor standards clauses in your contract and DOL regulations provide for administrative review of issues where there is a difference of views between the contract administrator and any employer. The most common circumstances include:

- a. Additional classifications and wage rates. Additional classification and wage rate requests are sometimes denied by the DOL. An employer that is dissatisfied with the denial can request reconsideration by the DOL Wage and Hour Administrator. The employer may continue to pay the wage rate, as requested, until a final decision is rendered on the matter. When the final decision is known, the employer will be required to pay any additional wages that may be necessary to satisfy the wage rate that is established.
  1. Reconsideration. The DOL normally identifies the reasons for denial in its response to the request. Any interested person (for example, the contract administrator, employer, representatives of the employees) may request reconsideration of the decision on the additional classification request. The request for reconsideration must be made in writing and must thoroughly address the denial reasons identified by the DOL. Employer requests for reconsideration should be made through the contract administrator but may be made directly to the DOL. (See 2-2(d), and also DOL Regulations 29 CFR 1.8.) All requests initiated by or made through the contract administrator or HUD must be submitted through the HUD Headquarters Office of Labor Relations.

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2. **Administrative Review Board.** Any interested party may request a review of the Administrator's decision on reconsideration by the DOL's Administrative Review Board. DOL regulations 29 CFR Part 7 explain the procedures for such reviews. (See also 29 CFR 1.9.)
- b. **Findings of underpayment.** Compliance reviews and other follow-up enforcement actions may result in findings of underpayment. The primary goal in every case and at every step in this process is to reach agreements about who may have been underpaid and how much wage restitution may be due and, of course, to promptly deliver restitution to any underpaid workers. The contract administrator will usually work informally with you to reach such agreements. You will have an opportunity to provide additional information to the contract administrator that may explain apparent inconsistencies and/or resolve the discrepancies.

If informal exchanges do not result in agreement, the final determination and schedule of back wages due will be presented to you in writing and you will be permitted 30 days in which to correct the underpayment(s) or to request a hearing on the matter before the DOL. The request for hearing must be made in writing through the contract administrator and must explain what findings are in dispute and the reasons. In such cases, HUD is required to submit a report to DOL for review and further consideration. All requests for DOL hearing must be submitted through the HUD Headquarters Office of Labor Relations.

1. **DOL review.** The DOL will review the contract administrator's report and the arguments against the findings presented in the hearing request. The DOL may affirm or modify the findings based upon the materials presented. You will be notified in writing by the DOL of the results of its review. If DOL concludes that violations have occurred, you will be given an opportunity to correct any underpayments or to request a hearing before a DOL Administrative Law Judge (ALJ). (See DOL Regulations 29 CFR 5.11 (b) and 29 CFR Part 6, Rules of Practice for Administrative Proceedings.)
2. **Administrative Review Board.** Contractors and/or subcontractors may request a review by the Administrative Review Board of the decision(s) rendered by the DOL ALJ in the administrative hearing process. See DOL regulations 29 CFR Part 7 for more information about this proceeding.

### **3-3 WITHHOLDING.**

The contract administrator shall cause withholding from payments due to the prime contractor to ensure the payment of wages which are believed to be due and unpaid, for example, if wage underpayments or other violations are not corrected within 30 days after written notification to the prime contractor. DOL may also direct the withholding of contract payments for alleged wage underpayments. Withholding is considered to be serious and is not taken unless warranted. If withholding is deemed necessary, you will be notified in writing. Only the amounts needed to meet the contractor's (and/or subcontractors') liability shall be withheld.

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### 3-4 DEPOSITS AND ESCROWS.

In every case, we attempt to complete compliance actions and resolve any disputes before the project is completed and final payments are made. Sometimes, corrective actions or disputes continue after completion and provisions must be made to ensure that funds are available to pay any wage restitution that is ultimately found due. In these cases, we allow projects to proceed to final closing and final payments provided the prime contractor deposits an amount equal to the potential liability for wage restitution and liquidated damages, if necessary, in a special account. The deposit or escrow account is controlled by the contract administrator. When a final decision is rendered, the contract administrator makes disbursements from the account in accordance with the decision. Deposit/escrow accounts are established for one or more of the following reasons:

Remember, the prime contractor is responsible and will be held liable for any wage restitution that is due to any worker employed in the construction of the project, including workers employed by subcontractors and any lower-tier subcontractors. See 1-4, Responsibility of the Principal Contractor, and 2-8, Restitution for Underpayment of Wages.

- a. **Where the parties have agreed to amounts of wage restitution that are due** but the employer hasn't furnished evidence yet that all of the underpaid workers have received their back wages, e.g., some of the workers have moved and could not be located. The amount of the deposit is equal to the total gross amount of restitution due to workers lacking payment evidence. As these workers are paid and proper documentation is provided to the contract administrator, amounts corresponding to the documented payments are returned to the depositor. Amounts for any workers who cannot be located are held in the deposit/escrow account for three years and disposed as described in 2-8(f) of this Guide.
- b. **Where underpayments are suspected or alleged and an investigation has not yet been completed.** The deposit is equal to the amount of wage restitution and any liquidated damages, if applicable, that are estimated to be due. If the final determination of wages due is less than the amount estimated and placed in the escrow account, the escrow will be reduced to the final amount and the difference will be returned to the depositor.

If the parties agree to the investigative findings, the amounts due to the workers will be paid by the employer. As these workers are paid and proper documentation is provided to the contract administrator, the gross amounts corresponding to the documented payments are returned to the depositor.

1. If the employer is unable to make the payments to the workers, e.g., lacks the funds necessary, the contract administrator may make disbursements directly to the workers in the net amounts calculated by the employer. The amounts withheld from the workers for tax deduction will be returned to the employer as payments to workers are made. The employer shall be responsible for reporting and transmitting withholdings to the appropriate agencies.

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2. If the employer is not cooperating in the resolution, the contract administrator shall make disbursements to the workers in accordance with the schedule of wages due. Amounts for unfound workers will be retained as described above (See 2-8(f) and 3-4(a)).

If the parties do not agree and an administrative hearing is requested, the escrow will be maintained as explained in 3-4(c), below.

Remember, if you have any questions or need assistance concerning labor standards requirements help is always available. Contact the contract administrator for the project you're working on or the HUD Field Labor Relations staff in your area.

- c. **Where the parties are waiting for the outcome of an administrative hearing** that has been or will be requested contesting a final determination of wages due. The deposit shall be equal to the amount of wage restitution and liquidated damages, if applicable, that have been determined due. Once a final decision is rendered, disbursements from the escrow account are made in accordance with the decision.

### **3-5 ADMINISTRATIVE SANCTIONS.**

Contractors and/or subcontractors that violate the labor standards provisions may face administrative sanctions imposed by HUD and/or DOL.

- a. **DOL debarment.** Contractors and/or subcontractors that are found by the Secretary of Labor to be in aggravated or willful violation of the labor standards provisions of the Davis-Bacon and Related Acts (DBRA) will be ineligible (debarred) to participate in any DBRA or Davis-Bacon Act contracts for up to 3 years. Debarment includes the contractor or subcontractor and any firm, corporation, partnership or association in which the contractor or subcontractor has a substantial interest. Debarment proceedings can be recommended by the contract administrator or can be initiated by the DOL. Debarment proceedings are described in DOL regulations 29 CFR 5.12.
- b. **HUD sanctions.** HUD sanctions may include Limited Denials of Participation (LDPs), debarments and suspensions.
  1. **Limited Denial of Participation.** HUD may issue to the employer a limited denial of participation (LDP) which prohibits the employer from further participation in HUD programs for a period up to one year. The LDP is usually effective for the HUD program in which the violation occurred and for the geographic jurisdiction of the issuing HUD Office. HUD regulations concerning LDP's are found at 24 CFR 24.700-24.714.



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2. **Debarment and suspensions.** In certain circumstances, HUD may initiate its own debarment or suspension proceedings against a contractor and/or subcontractor in connection with improper actions regarding Davis-Bacon obligations. For example, HUD may initiate debarment where a contractor has been convicted for making false statements (such as false statements on certified payrolls or other prevailing wage certifications) or may initiate suspension where a contractor has been indicted for making false statements. HUD regulations concerning debarment and suspension are found at 24 CFR Part 24.

### **3-6 FALSIFICATION OF CERTIFIED PAYROLL REPORTS.**

Contractors and/or subcontractors that are found to have willfully falsified payroll reports (Statements of Compliance), including correction certified payroll reports, may be subject to civil or criminal prosecution. Penalties may be imposed of \$1,000 and/or one year in prison for each false statement (see Section 1001 of Title 18 and Section 231 of Title 31 of the United States Code).

Remember, if you have any questions or need assistance concerning labor standards requirements help is always available. Contact the contract administrator for the project you're working on or the HUD Field Labor Relations staff in your area.

## ACRONYMS AND SYMBOLS

CDBG -	Community Development Block Grant
CFR -	Code of Federal Regulations
CPR -	Certified Payroll Report
CWHSSA -	Contract Work Hours and Safety Standards Act
DBA -	Davis-Bacon Act
DBRA -	Davis-Bacon and Related Acts
DOL -	Department of Labor
FHA -	Federal Housing Administration
FLSA -	Fair Labor Standards Act
HUD -	Housing and Urban Development (Department of)
IHA -	Indian Housing Authority
LCA -	Local Contracting Agency
LDP -	Limited Denial of Participation
O/T -	Overtime
PHA -	Public Housing Agency
S/T -	Straight-time
SAC -	State Apprenticeship Council/Agency
TDHE -	Tribally-Designated Housing Entity
§ -	Section
¶ -	Paragraph

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## DAVIS-BACON - RELATED WEB SITES\*

HUD Office of Labor Relations:  
[www.hud.gov/offices/olr](http://www.hud.gov/offices/olr)

HUD Regulations:  
<http://www.gpo.gov/fdsys/browse/collectionCfr.action?collectionCode=CFR>

HUDClips (HUD Forms and Publications):  
[www.hud.gov/offices/adm/hudclips/index.cfm](http://www.hud.gov/offices/adm/hudclips/index.cfm)

DOL Davis-Bacon and Related Acts Homepage:  
<http://www.dol.gov/whd/contracts/dbra.htm>

DOL Regulations:  
<http://www.gpo.gov/fdsys/browse/collectionCfr.action?collectionCode=CFR>

Davis-Bacon Wage Decisions:  
[www.wdol.gov](http://www.wdol.gov)

DOL Forms:  
[www.dol.gov/whd/programs/dbra/forms.htm](http://www.dol.gov/whd/programs/dbra/forms.htm)

**\*Web addresses active as of January 2012**

<b>Project Wage Rate Sheet</b>			U.S. Department of Housing and Urban Development Office of Labor Relations			
<b>Project Name:</b>			<b>Wage Decision Number/Modification Number:</b>			
<b>Project Number:</b>			<b>Project County:</b>			
<b>Work Classification</b>	<b>Basic Hourly Rate (BHR)</b>	<b>Fringe Benefits</b>	<b>Total Hourly Wage Rate</b>	<b>Laborers Fringe Benefits</b>		<b>\$</b>
Bricklayers			\$	<b>Group #</b>	<b>BHR</b>	<b>Total Wage</b>
Carpenters			\$			\$
Cement Masons			\$			\$
Drywall Hangers			\$			\$
Electricians			\$			\$
Iron Workers			\$			\$
Painters			\$	<b>Operators Fringe Benefits:</b>		\$
Plumbers			\$	<b>Group #</b>	<b>BHR</b>	<b>Total Wage</b>
Roofers			\$			\$
Sheet Metal Workers			\$			\$
Soft Floor Workers			\$			\$
Tapers			\$			\$
Tile Setters			\$	<b>Truck Drivers Fringe Benefits:</b>		\$
<b>Other Classifications</b>				<b>Group #</b>	<b>BHR</b>	<b>Total Wage</b>
			\$			
			\$			
			\$			
<b>Additional Classifications (HUD Form 4230-A)</b>						
<b>Work Classification</b>	<b>Basic Hourly Rate (BHR)</b>	<b>Fringe Benefits</b>	<b>Total Hourly Wage Rate</b>	<b>Date of HUD Submission to DOL</b>		<b>Date of DOL Approval</b>
			\$			
			\$			
			\$			



Date \_\_\_\_\_  
 I, \_\_\_\_\_ (Name of Signatory Party) \_\_\_\_\_ (Title)  
 do hereby state:

(1) That I pay or supervise the payment of the persons employed by \_\_\_\_\_ (Contractor or Subcontractor) \_\_\_\_\_ on the \_\_\_\_\_ (Building or Work) \_\_\_\_\_ that during the payroll period commencing on the \_\_\_\_\_ day of \_\_\_\_\_ and ending the \_\_\_\_\_ day of \_\_\_\_\_ all persons employed on said project have been paid the full weekly wages earned, that no rebates have been or will be made either directly or indirectly to or on behalf of said \_\_\_\_\_ (Contractor or Subcontractor) \_\_\_\_\_ from the full weekly wages earned by any person and that no deductions have been made either directly or indirectly from the full wages earned by any person, other than permissible deductions as defined in Regulations, Part 3 (29 C.F.R. Subtitle A), issued by the Secretary of Labor under the Copeland Act, as amended (48 Stat. 948, 63 Stat. 108, 72 Stat. 357, 49 U.S.C. § 3145), and described below:

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

(2) That any payrolls otherwise under this contract required to be submitted for the above period are correct and complete; that the wage rates for laborers or mechanics contained therein are not less than the applicable wage rates contained in any wage determination incorporated into the contract; that the classifications set forth therein for each laborer or mechanic conform with the work he performed.

(3) That any apprentices employed in the above period are duly registered in a bona fide apprenticeship program registered with a State apprenticeship agency recognized by the Bureau of Apprenticeship and Training, United States Department of Labor, or if no such recognized agency exists in a State, are registered with the Bureau of Apprenticeship and Training, United States Department of Labor.

(4) That:  
 (a) WHERE FRINGE BENEFITS ARE PAID TO APPROVED PLANS, FUNDS, OR PROGRAMS  
 - in addition to the basic hourly wage rates paid to each laborer or mechanic listed in the above referenced payroll, payments of fringe benefits as listed in the contract have been or will be made to appropriate programs for the benefit of such employees, except as noted in section 4(c) below.

(b) WHERE FRINGE BENEFITS ARE PAID IN CASH

- Each laborer or mechanic listed in the above referenced payroll has been paid, as indicated on the payroll, an amount not less than the sum of the applicable basic hourly wage rate plus the amount of the required fringe benefits as listed in the contract, except as noted in section 4(c) below.

(c) EXCEPTIONS

EXCEPTION (CRAFT)	EXPLANATION

REMARKS

NAME AND TITLE	SIGNATURE

THE WILLFUL FALSIFICATION OF ANY OF THE ABOVE STATEMENTS MAY SUBJECT THE CONTRACTOR OR SUBCONTRACTOR TO CIVIL OR CRIMINAL PROSECUTION. SEE SECTION 1301 OF TITLE 18 AND SECTION 231 OF TITLE 31 OF THE UNITED STATES CODE



U.S. Department of Housing and Urban Development  
Office of Departmental Operations and Coordination  
Washington, DC 20410

Email: [www.OfficeofLaborRelations@hud.gov](mailto:www.OfficeofLaborRelations@hud.gov)

**Labor Relations Desk Guide**  
**LR01.DG**





# MONTHLY EMPLOYMENT UTILIZATION REPORT

**TO:** \_\_\_\_\_  
Name of City/County

**FROM:** \_\_\_\_\_  
Name of Construction Contractor

**NAME OF PROJECT:**  
\_\_\_\_\_

\_\_\_\_\_  
Address of Contractor

**PROJECT NUMBER:**  
\_\_\_\_\_

\_\_\_\_\_  
Phone No. of Contractor

**REPORTING PERIOD:**  
\_\_\_\_\_

## PERCENTAGE OF PROJECT COMPLETION:

CLASSIFICATION	WORK HOURS OF EMPLOYMENT									
	TOTAL	BLACK	HISPANIC	ASIAN/ PACIFIC	FEMALE	HANDICAPPED	VIETNAM VETERAN	LOW INCOME SEC. 3 RESIDENT	TEMP	FULL- TIME
<b>CRAFTWORKER</b> Permanent										
<b>CRAFTWORKER</b> New Employee										
<b>LABORER</b> Permanent										
<b>LABORER</b> New Employee										
<b>APPRENTICE</b> Permanent										
<b>APPRENTICE</b> New Employee										
<b>TOTALS</b>										

Number of Minority Employees on Project \_\_\_\_\_  
 Number of Female Employees on Project \_\_\_\_\_  
 Number of Low Income/Section 3 Residents on Project \_\_\_\_\_  
 Number of Handicapped Employees on Project \_\_\_\_\_  
 Number of Vietnam Veterans on Project \_\_\_\_\_

\_\_\_\_\_  
Signature and Title of Company Official Completing Report

\_\_\_\_\_  
Date Signed

# PAYROLL DEDUCTION AUTHORIZATION

This is authorization to \_\_\_\_\_ to deduct from my paycheck

\$\_\_\_\_\_. This for item number:

### Repayment of:

- |                    |                          |
|--------------------|--------------------------|
| 1. Loan            | 7. Credit Union          |
| 2. Retirement      | 8. Profit Sharing        |
| 3. Advance on Wage | 9. Donations to Agencies |
| 4. Savings         | 10. Insurance Premiums   |
| 5. Savings Bonds   | 11. Union Dues           |
| 6. Uniforms        | 12. Other                |

\*This deduction is to be made:

Check Appropriate Box	
<input type="checkbox"/>	One time only
<input type="checkbox"/>	Weekly
<input type="checkbox"/>	Bi-Weekly
<input type="checkbox"/>	For _____ weeks
<input type="checkbox"/>	

Employee's Signature & Date: \_\_\_\_\_

Printed or Typed Name: \_\_\_\_\_

Project Name and No.: \_\_\_\_\_





### Applicability

The Project or Program to which the construction work covered by this contract pertains is being assisted by the United States of America and the following Federal Labor Standards Provisions are included in this Contract pursuant to the provisions applicable to such Federal assistance.

**A. 1. (i) Minimum Wages.** All laborers and mechanics employed or working upon the site of the work, will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR Part 3), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics. Contributions made or costs reasonably anticipated for bona fide fringe benefits under Section I(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of 29 CFR 5.5(a)(1)(iv); also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs, which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period.

Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under 29 CFR 5.5(a)(1)(ii) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible, place where it can be easily seen by the workers.

**(ii) (a)** Any class of laborers or mechanics which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. HUD shall approve an additional classification and wage rate and fringe benefits therefor only when the following criteria have been met:

**(1)** The work to be performed by the classification requested is not performed by a classification in the wage determination; and

**(2)** The classification is utilized in the area by the construction industry; and

**(3)** The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

**(b)** If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and HUD or its designee agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by HUD or its designee to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, D.C. 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise HUD or its designee or will notify HUD or its designee within the 30-day period that additional time is necessary. (Approved by the Office of Management and Budget under OMB control number 1215-0140.)

**(c)** In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and HUD or its designee do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), HUD or its designee shall refer the questions, including the views of all interested parties and the recommendation of HUD or its designee, to the Administrator for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise HUD or its designee or will notify HUD or its designee within the 30-day period that additional time is necessary. (Approved by the Office of Management and Budget under OMB Control Number 1215-0140.)

**(d)** The wage rate (including fringe benefits where appropriate) determined pursuant to subparagraphs (1)(ii)(b) or (c) of this paragraph, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

**(iii)** Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

**(iv)** If the contractor does not make payments to a trustee or other third person, the contractor may consider as part

of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program. (Approved by the Office of Management and Budget under OMB Control Number 1215-0140.)

**2. Withholding.** HUD or its designee shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld from the contractor under this contract or any other Federal contract with the same prime contractor, or any other Federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee or helper, employed or working on the site of the work, all or part of the wages required by the contract, HUD or its designee may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased. HUD or its designee may, after written notice to the contractor, disburse such amounts withheld for and on account of the contractor or subcontractor to the respective employees to whom they are due. The Comptroller General shall make such disbursements in the case of direct Davis-Bacon Act contracts.

**3. (i) Payrolls and basic records.** Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in Section 1(b)(2)(B) of the Davis-bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5 (a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in Section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been

communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs. (Approved by the Office of Management and Budget under OMB Control Numbers 1215-0140 and 1215-0017.)

**(ii) (a)** The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to HUD or its designee if the agency is a party to the contract, but if the agency is not such a party, the contractor will submit the payrolls to the applicant sponsor, or owner, as the case may be, for transmission to HUD or its designee. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i) except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g., the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division Web site at <http://www.dol.gov/esa/whd/forms/wh347instr.htm> or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to HUD or its designee if the agency is a party to the contract, but if the agency is not such a party, the contractor will submit the payrolls to the applicant sponsor, or owner, as the case may be, for transmission to HUD or its designee, the contractor, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this subparagraph for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to HUD or its designee. (Approved by the Office of Management and Budget under OMB Control Number 1215-0149.)

**(b)** Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

**(1)** That the payroll for the payroll period contains the information required to be provided under 29 CFR 5.5 (a)(3)(ii), the appropriate information is being maintained under 29 CFR 5.5(a)(3)(i), and that such information is correct and complete;

(2) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in 29 CFR Part 3;

(3) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(c) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by subparagraph A.3.(ii)(b).

(d) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under Section 1001 of Title 18 and Section 231 of Title 31 of the United States Code.

(iii) The contractor or subcontractor shall make the records required under subparagraph A.3.(i) available for inspection, copying, or transcription by authorized representatives of HUD or its designee or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, HUD or its designee may, after written notice to the contractor, sponsor, applicant or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

#### 4. Apprentices and Trainees.

(i) **Apprentices.** Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who

is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(ii) **Trainees.** Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by

the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

**(iii) Equal employment opportunity.** The utilization of apprentices, trainees and journeymen under 29 CFR Part 5 shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR Part 30.

**5. Compliance with Copeland Act requirements.** The contractor shall comply with the requirements of 29 CFR Part 3 which are incorporated by reference in this contract

**6. Subcontracts.** The contractor or subcontractor will insert in any subcontracts the clauses contained in subparagraphs 1 through 11 in this paragraph A and such other clauses as HUD or its designee may by appropriate instructions require, and a copy of the applicable prevailing wage decision, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in this paragraph.

**7. Contract termination; debarment.** A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

**8. Compliance with Davis-Bacon and Related Act Requirements.** All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR Parts 1, 3, and 5 are herein incorporated by reference in this contract

**9. Disputes concerning labor standards.** Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR Parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and HUD or its designee, the U.S. Department of Labor, or the employees or their representatives.

**10. (i) Certification of Eligibility.** By entering into this contract the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of Section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1) or to be

awarded HUD contracts or participate in HUD programs pursuant to 24 CFR Part 24.

**(ii)** No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of Section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1) or to be awarded HUD contracts or participate in HUD programs pursuant to 24 CFR Part 24.

**(iii)** The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001. Additionally, U.S. Criminal Code, Section 1010, Title 18, U.S.C., "Federal Housing Administration transactions", provides in part: "Whoever, for the purpose of . . . influencing in any way the action of such Administration . . . makes, utters or publishes any statement knowing the same to be false . . . shall be fined not more than \$5,000 or imprisoned not more than two years, or both."

**11. Complaints, Proceedings, or Testimony by Employees.** No laborer or mechanic to whom the wage, salary, or other labor standards provisions of this Contract are applicable shall be discharged or in any other manner discriminated against by the Contractor or any subcontractor because such employee has filed any complaint or instituted or caused to be instituted any proceeding or has testified or is about to testify in any proceeding under or relating to the labor standards applicable under this Contract to his employer.

**B. Contract Work Hours and Safety Standards Act.** The provisions of this paragraph B are applicable where the amount of the prime contract exceeds \$100,000. As used in this paragraph, the terms "laborers" and "mechanics" include watchmen and guards.

**(1) Overtime requirements.** No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which the individual is employed on such work to work in excess of 40 hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of 40 hours in such workweek.

**(2) Violation; liability for unpaid wages; liquidated damages.** In the event of any violation of the clause set forth in subparagraph (1) of this paragraph, the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in subparagraph (1) of this paragraph, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of 40 hours without payment of the overtime wages required by the clause set forth in subparagraph (1) of this paragraph.



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**(3) Withholding for unpaid wages and liquidated damages.** HUD or its designee shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contract, or any other Federally-assisted contract subject to the Contract Work Hours and Safety Standards Act which is held by the same prime contractor such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in subparagraph (2) of this paragraph.

**(4) Subcontracts.** The contractor or subcontractor shall insert in any subcontracts the clauses set forth in subparagraph (1) through (4) of this paragraph and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in subparagraphs (1) through (4) of this paragraph.

**C. Health and Safety.** The provisions of this paragraph C are applicable where the amount of the prime contract exceeds \$100,000.

**(1)** No laborer or mechanic shall be required to work in surroundings or under working conditions which are unsanitary, hazardous, or dangerous to his health and safety as determined under construction safety and health standards promulgated by the Secretary of Labor by regulation.

**(2)** The Contractor shall comply with all regulations issued by the Secretary of Labor pursuant to Title 29 Part 1926 and failure to comply may result in imposition of sanctions pursuant to the Contract Work Hours and Safety Standards Act, (Public Law 91-54, 83 Stat 96). 40 USC 3701 et seq.

**(3)** The contractor shall include the provisions of this paragraph in every subcontract so that such provisions will be binding on each subcontractor. The contractor shall take such action with respect to any subcontractor as the Secretary of Housing and Urban Development or the Secretary of Labor shall direct as a means of enforcing such provisions.

**CONSTRUCTION IDENTIFICATION  
SIGN:**

SIZE, 4' - 0" X 8' -0"

Letters to be brown with beige background

Construction Identification Signs To Be Erected Prior To Beginning of Actual Construction

Wood for Signs Shall Be 3/4" Waterproofing Resin Bonded Exterior Grade Plywood (Douglas Fir Plywood Association or Equal)

Payment for Furnishing, Erecting, Maintaining and Removing Construction Identification Signs Will Not Be made Directly. Such Costs Shall be Included in the Overall Bid Submitted.

To Be Erected As Indicated on Title Sheet.



**CITY OF ANY TOWN**

IN PARTNERSHIP WITH THE

**COUNTY OF HIDALGO**

**URBAN COUNTY PROGRAM**

**ANY PROJECT  
PROJECT NUMBER**

**CITY OFFICIALS**

**CONTRACTOR**

**ENGINEER/ARCHITECT**

HUD-42385(R) Previous Edition is obsolete  
\*\* Attachment to Federal Labor Standards Provisions

# EMPLOYEE RIGHTS UNDER THE DAVIS-BACON ACT

## FOR LABORERS AND MECHANICS EMPLOYED ON FEDERAL OR FEDERALLY ASSISTED CONSTRUCTION PROJECTS

THE UNITED STATES DEPARTMENT OF LABOR WAGE AND HOUR DIVISION

### **PREVAILING WAGES**

You must be paid not less than the wage rate listed in the Davis-Bacon Wage Decision posted with this Notice for the work you perform.

### **OVERTIME**

You must be paid not less than one and one-half times your basic rate of pay for all hours worked over 40 in a work week. There are few exceptions.

### **ENFORCEMENT**

Contract payments can be withheld to ensure workers receive wages and overtime pay due, and liquidated damages may apply if overtime pay requirements are not met. Davis-Bacon contract clauses allow contract termination and debarment of contractors from future federal contracts for up to three years. A contractor who falsifies certified payroll records or induces wage kickbacks may be subject to civil or criminal prosecution, fines and/or imprisonment.

### **APPRENTICES**

Apprentice rates apply only to apprentices properly registered under approved Federal or State apprenticeship programs.

### **PROPER PAY**

If you do not receive proper pay, or require further information on the applicable wages, contact the Contracting Officer listed below:

[Empty box for Contracting Officer contact information]

or contact the U.S. Department of Labor's Wage and Hour Division.



For additional information:

**1-866-4-USWAGE**  
(1-866-487-9243) TTY: 1-877-889-5627



**WWW.WAGEHOUR.DOL.GOV**

# DERECHOS DEL EMPLEADO BAJO LA LEY DAVIS-BACON

## PARA OBREROS Y MECÁNICOS EMPLEADOS EN PROYECTOS DE CONSTRUCCIÓN FEDERAL O CON ASISTENCIA FEDERAL

LA SECCIÓN DE HORAS Y SUELDOS DEL DEPARTAMENTO DE TRABAJO DE EEUU

### **SALARIOS PREVALECIENTES**

No se le puede pagar menos de la tasa de pago indicada en la Decisión de Salarios Davis-Bacon fijada con este Aviso para el trabajo que Ud. desempeña.

### **SOBRETIEMPO**

Se le ha de pagar no menos de tiempo y medio de su tasa básica de pago por todas las horas trabajadas en exceso de 40 en una semana laboral. Existen pocas excepciones.

### **CUMPLIMIENTO**

Se pueden retener pagos por contratos para asegurarse que los obreros reciban los salarios y el pago de sobretiempo debidos, y se podría aplicar daños y perjuicios si no se cumple con las exigencias del pago de sobretiempo. Las cláusulas contractuales de Davis-Bacon permiten la terminación y exclusión de contratistas para efectuar futuros contratos federales hasta tres años. El contratista que falsifique los registros certificados de las nóminas de pago o induzca devoluciones de salarios puede ser sujeto a procesamiento civil o criminal, multas y/o encarcelamiento.

### **APRENDICES**

Las tasas de aprendices sólo se aplican a aprendices correctamente inscritos bajo programas federales o estatales aprobados.

### **PAGO APROPIADO**

Si Ud. no recibe el pago apropiado, o precisa de información adicional sobre los salarios aplicables, póngase en contacto con el Contratista Oficial que aparece abajo:



o póngase en contacto con la Sección de Horas y Sueldos del Departamento de Trabajo de EEUU.



Para obtener información adicional:

**1-866-4-USWAGE**  
(1-866-487-9243) TTY: 1-877-889-5627



**WWW.WAGEHOUR.DOL.GOV**

# Equal Employment Opportunity is **THE LAW**

## **Private Employers, State and Local Governments, Educational Institutions, Employment Agencies and Labor Organizations**

Applicants to and employees of most private employers, state and local governments, educational institutions, employment agencies and labor organizations are protected under Federal law from discrimination on the following bases:

### **RACE, COLOR, RELIGION, SEX, NATIONAL ORIGIN**

Title VII of the Civil Rights Act of 1964, as amended, protects applicants and employees from discrimination in hiring, promotion, discharge, pay, fringe benefits, job training, classification, referral, and other aspects of employment, on the basis of race, color, religion, sex (including pregnancy), or national origin. Religious discrimination includes failing to reasonably accommodate an employee's religious practices where the accommodation does not impose undue hardship.

### **DISABILITY**

Title I and Title V of the Americans with Disabilities Act of 1990, as amended, protect qualified individuals from discrimination on the basis of disability in hiring, promotion, discharge, pay, fringe benefits, job training, classification, referral, and other aspects of employment. Disability discrimination includes not making reasonable accommodation to the known physical or mental limitations of an otherwise qualified individual with a disability who is an applicant or employee, barring undue hardship.

### **GENETICS**

Title II of the Genetic Information Nondiscrimination Act of 2008 protects applicants and employees from discrimination based on genetic information in hiring, promotion, discharge, pay, fringe benefits, job training, classification, referral, and other aspects of employment. GINA also restricts employers' acquisition of genetic information and strictly limits disclosure of genetic information. Genetic information includes information about genetic tests of applicants, employees, or their family members; the manifestation of diseases or disorders in family members (family medical history); and requests for or receipt of genetic services by applicants, employees, or their family members.

### **RETALIATION**

All of these Federal laws prohibit covered entities from retaliating against a person who files a charge of discrimination, participates in a discrimination proceeding, or otherwise opposes an unlawful employment practice.

### **AGE**

The Age Discrimination in Employment Act of 1967, as amended, protects applicants and employees 40 years of age or older from discrimination based on age in hiring, promotion, discharge, pay, fringe benefits, job training, classification, referral, and other aspects of employment.

### **SEX (WAGES)**

In addition to sex discrimination prohibited by Title VII of the Civil Rights Act, as amended, the Equal Pay Act of 1963, as amended, prohibits sex discrimination in the payment of wages to women and men performing substantially equal work, in jobs that require equal skill, effort, and responsibility, under similar working conditions, in the same establishment.

### **WHAT TO DO IF YOU BELIEVE DISCRIMINATION HAS OCCURRED**

There are strict time limits for filing charges of employment discrimination. To preserve the ability of EEOC to act on your behalf and to protect your right to file a private lawsuit, should you ultimately need to, you should contact EEOC promptly when discrimination is suspected:

The U.S. Equal Employment Opportunity Commission (EEOC), 1-800-669-4000 (toll-free) or 1-800-669-6820 (toll-free TTY number for individuals with hearing impairments). EEOC field office information is available at [www.eeoc.gov](http://www.eeoc.gov) or in most telephone directories in the U.S. Government or Federal Government section. Additional information about EEOC, including information about charge filing, is available at [www.eeoc.gov](http://www.eeoc.gov).

## Employers Holding Federal Contracts or Subcontracts

Applicants to and employees of companies with a Federal government contract or subcontract are protected under Federal law from discrimination on the following bases:

### **RACE, COLOR, RELIGION, SEX, NATIONAL ORIGIN**

Executive Order 11246, as amended, prohibits job discrimination on the basis of race, color, religion, sex or national origin, and requires affirmative action to ensure equality of opportunity in all aspects of employment.

### **INDIVIDUALS WITH DISABILITIES**

Section 503 of the Rehabilitation Act of 1973, as amended, protects qualified individuals from discrimination on the basis of disability in hiring, promotion, discharge, pay, fringe benefits, job training, classification, referral, and other aspects of employment. Disability discrimination includes not making reasonable accommodation to the known physical or mental limitations of an otherwise qualified individual with a disability who is an applicant or employee, barring undue hardship. Section 503 also requires that Federal contractors take affirmative action to employ and advance in employment qualified individuals with disabilities at all levels of employment, including the executive level.

### **DISABLED, RECENTLY SEPARATED, OTHER PROTECTED, AND ARMED FORCES SERVICE MEDAL VETERANS**

The Vietnam Era Veterans' Readjustment Assistance Act of 1974, as amended, 38 U.S.C. 4212, prohibits job discrimination and requires affirmative action to employ and advance in employment disabled veterans, recently separated veterans (within

three years of discharge or release from active duty), other protected veterans (veterans who served during a war or in a campaign or expedition for which a campaign badge has been authorized), and Armed Forces service medal veterans (veterans who, while on active duty, participated in a U.S. military operation for which an Armed Forces service medal was awarded).

### **RETALIATION**

Retaliation is prohibited against a person who files a complaint of discrimination, participates in an OFCCP proceeding, or otherwise opposes discrimination under these Federal laws.

Any person who believes a contractor has violated its nondiscrimination or affirmative action obligations under the authorities above should contact immediately:

The Office of Federal Contract Compliance Programs (OFCCP), U.S. Department of Labor, 200 Constitution Avenue, N.W., Washington, D.C. 20210, 1-800-397-6251 (toll-free) or (202) 693-1337 (TTY). OFCCP may also be contacted by e-mail at [OFCCP-Public@dol.gov](mailto:OFCCP-Public@dol.gov), or by calling an OFCCP regional or district office, listed in most telephone directories under U.S. Government, Department of Labor.

## Programs or Activities Receiving Federal Financial Assistance

### **RACE, COLOR, NATIONAL ORIGIN, SEX**

In addition to the protections of Title VII of the Civil Rights Act of 1964, as amended, Title VI of the Civil Rights Act of 1964, as amended, prohibits discrimination on the basis of race, color or national origin in programs or activities receiving Federal financial assistance. Employment discrimination is covered by Title VI if the primary objective of the financial assistance is provision of employment, or where employment discrimination causes or may cause discrimination in providing services under such programs. Title IX of the Education Amendments of 1972 prohibits employment discrimination on the basis of sex in educational programs or activities which receive Federal financial assistance.

### **INDIVIDUALS WITH DISABILITIES**

Section 504 of the Rehabilitation Act of 1973, as amended, prohibits employment discrimination on the basis of disability in any program or activity which receives Federal financial assistance. Discrimination is prohibited in all aspects of employment against persons with disabilities who, with or without reasonable accommodation, can perform the essential functions of the job.

If you believe you have been discriminated against in a program of any institution which receives Federal financial assistance, you should immediately contact the Federal agency providing such assistance.

# La igualdad de oportunidades de empleo es

# LA LEY

## **Empleadores privados, gobiernos locales y estatales, instituciones educativas, agencias de empleo y organizaciones de trabajo**

Los postulantes y empleados de la mayoría de los empleadores privados y estatales, las instituciones educativas, las agencias de empleo y las organizaciones de trabajo están protegidos por la ley federal contra la discriminación en función de:

### **RAZA, COLOR, RELIGIÓN, SEXO, PROCEDENCIA**

El Título VII de la Ley de Derechos Civiles (Civil Rights Act) de 1964, con sus modificaciones, protege a los postulantes y a los empleados contra la discriminación en lo que respecta a la contratación, los ascensos, los despidos, los pagos, las compensaciones adicionales, la capacitación laboral, la clasificación, las referencias y los demás aspectos del empleo, en función de raza, color, religión, sexo (incluidas las embarazadas) o procedencia. La discriminación religiosa se refiere a la falta de adaptación razonable a las prácticas religiosas de un empleado, siempre y cuando dicha adaptación no provoque una dificultad económica desmedida para la compañía.

### **DISCAPACIDAD**

Los Títulos I y V de la Ley de Estadounidenses con Discapacidades (Americans with Disabilities Act) de 1990, con sus modificaciones, protege a las personas idóneas contra la discriminación por discapacidad en lo que respecta a la contratación, los ascensos, los despidos, los pagos, las compensaciones adicionales, la capacitación laboral, la clasificación, las referencias y los demás aspectos del empleo. La discriminación por discapacidad se refiere a la falta de adaptaciones razonables para las limitaciones físicas o mentales de una persona idónea que tiene una discapacidad y que es un postulante o un empleado, salvo que dichas adaptaciones provoquen una dificultad económica desmedida para la compañía.

### **EDAD**

La Ley contra la Discriminación Laboral por Edad (Age Discrimination in Employment Act) de 1967, con sus modificaciones, protege a los postulantes y empleados de 40 años o más contra la discriminación por cuestiones de edad en lo que respecta a la contratación, los ascensos, los despidos, los pagos, las compensaciones adicionales, la capacitación laboral, la clasificación, las referencias y los demás aspectos del empleo.

### **SEXO (SALARIOS)**

Además de lo establecido en el Título VII de la Ley de Derechos Civiles, con sus modificaciones, la Ley de Igualdad en las Remuneraciones (Equal Pay Act) de 1963, con sus modificaciones, también prohíbe la discriminación sexual en el pago de los salarios a las mujeres y los hombres que realicen básicamente el mismo trabajo, en empleos que requieran las mismas habilidades, esfuerzo y responsabilidad, en condiciones laborales similares, en el mismo establecimiento.

### **GENÉTICA**

El Título II de la Ley de No Discriminación por Información Genética (Genetic Information Nondiscrimination Act, GINA) de 2008 protege a los postulantes y empleados contra la discriminación basada en la información genética en lo que respecta a la contratación, los ascensos, los despidos, los pagos, las compensaciones adicionales, la capacitación laboral, la clasificación, las referencias y los demás aspectos del empleo. La GINA también limita la adquisición de información genética por parte de los empleadores y condiciona de manera estricta su divulgación. La información genética incluye las pruebas genéticas de los postulantes, empleados o integrantes de sus familias, la manifestación de enfermedades o trastornos de los miembros de la familia (historia médica familiar) y las solicitudes o la recepción de servicios genéticos por parte de los postulantes, empleados o integrantes de sus familias.

### **REPRESALIAS**

Todas estas leyes federales prohíben a las entidades cubiertas que tomen represalias en contra de una persona que presenta una carga por discriminación, participa en un procedimiento por discriminación o que, de algún otro modo, se opone a una práctica laboral ilícita.

### **QUÉ DEBE HACER SI CONSIDERA QUE ES VÍCTIMA DE LA DISCRIMINACIÓN**

Existen plazos estrictos para presentar cargos por discriminación laboral. A fin de preservar la capacidad de la Comisión para la Igualdad de Oportunidades en el Empleo (Equal Employment Opportunity Commission, EEOC) de actuar en representación suya y proteger su derecho a iniciar una demanda privada si fuese necesario en última instancia, debe comunicarse con la EEOC apenas sospeche que se produjo un hecho de discriminación: Comisión para la Igualdad de Oportunidades en el Empleo de los Estados Unidos, 1-800-669-4000 (línea gratuita) o 1-800-669-6820 (línea gratuita TTY para las personas con problemas auditivos). Puede encontrar información sobre las sucursales de la EEOC en [www.eeoc.gov](http://www.eeoc.gov) o en la mayoría de las guías telefónicas en la sección Gobierno Federal o Gobierno de los Estados Unidos. También puede obtener información adicional sobre la EEOC, incluso cómo presentar un cargo, en [www.eeoc.gov](http://www.eeoc.gov).



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## Empleadores que tengan contratos o subcontratos con el gobierno federal

Los postulantes y empleados de las compañías que tengan un contrato o subcontrato con el gobierno federal están protegidos por la ley federal contra la discriminación en función de:

### **RAZA, COLOR, RELIGIÓN, SEXO, PROCEDENCIA**

El Decreto Ejecutivo 11246, con sus modificaciones, prohíbe la discriminación en el trabajo en función de raza, color, religión, sexo o procedencia y exige que se implementen acciones afirmativas para garantizar la igualdad de oportunidades en todos los aspectos laborales.

### **PERSONAS CON DISCAPACIDADES**

La Sección 503 de la Ley de Rehabilitación (*Rehabilitation Act*) de 1973, con sus modificaciones, protege a las personas idóneas contra la discriminación por discapacidad en lo que respecta a la contratación, los ascensos, los despidos, los pagos, las compensaciones adicionales, la capacitación laboral, la clasificación, las referencias y los demás aspectos del empleo. La discriminación por discapacidad se refiere a la falta de adaptaciones razonables para las limitaciones físicas o mentales de una persona idónea que tiene una discapacidad y que es un postulante o un empleado, salvo que dichas adaptaciones provoquen una dificultad económica desmedida para la compañía. La Sección 503 también exige que los contratistas federales implementen acciones afirmativas para emplear y avanzar en el empleo de personas idóneas con discapacidades en todos los niveles laborales, incluido el nivel ejecutivo.

### **VETERANOS DISCAPACITADOS, RECIÉN RETIRADOS, BAJO PROTECCIÓN Y CON MEDALLA POR SERVICIO A LAS FUERZAS ARMADAS**

La Ley de Asistencia a la Readaptación de Veteranos de Vietnam (*Vietnam Era Veterans' Readjustment Assistance Act*) de 1974, con sus modificaciones, 38 U.S.C. 4212, prohíbe la discriminación laboral y exige que se implementen acciones afirmativas para emplear y avanzar en el empleo de los veteranos discapacitados, recién retirados

(en el plazo de los tres años posteriores a la baja o al cese del servicio activo), otros veteranos bajo protección (los veteranos que prestaron servicio durante una guerra o en una campaña o expedición para la cual se les autorizó una insignia de campaña) y los veteranos con medalla por servicio a las Fuerzas Armadas (aquellos que durante el servicio activo, participaron en una operación militar de los Estados Unidos por la cual se los reconoció con una medalla por servicio a las Fuerzas Armadas).

### **REPRESALIAS**

Quedan prohibidas las represalias contra una persona que presenta una demanda por discriminación, participa en un procedimiento de la Oficina de Programas de Cumplimiento de Contratos Federales (*Office of Federal Contract Compliance Programs*, OFCCP) o que se oponga, de algún otro modo, a la discriminación según estas leyes federales.

Toda persona que considere que un contratista violó sus obligaciones de acción afirmativa o no discriminación según las autoridades mencionadas anteriormente debe comunicarse de inmediato con:

La Oficina de Programas de Cumplimiento de Contratos Federales (OFCCP), Departamento de Trabajo de los Estados Unidos, 200 Constitution Avenue, N.W., Washington, D.C. 20210, teléfono 1-800-397-6251 (línea gratuita) o (202) 693-1337 (línea TTY). También puede enviar un mensaje de correo electrónico a la OFCCP (OFCCP-Public@dol.gov) o bien, llamar a una de sus oficinas regionales o del distrito, las cuales aparecen en la mayoría de las guías telefónicas en la sección Gobierno de los Estados Unidos, Departamento de Trabajo.

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## Programas o actividades que reciben asistencia financiera federal

### **RAZA, COLOR, PROCEDENCIA, SEXO**

Además de las protecciones establecidas en el Título VII de la Ley de Derechos Civiles de 1964 y sus modificaciones, el Título VI de dicha ley, con sus modificaciones, prohíbe la discriminación por raza, color o procedencia en los programas o las actividades que reciben asistencia financiera federal. La discriminación laboral está cubierta por el Título VI si el objetivo principal de la asistencia financiera es brindar empleo, o si la discriminación laboral provoca o puede provocar discriminación cuando se proporcionan los servicios de dichos programas. El Título IX de las Reformas Educativas de 1972 prohíbe la discriminación laboral según el sexo en los programas o las actividades educativas que reciben asistencia financiera federal.

### **PERSONAS CON DISCAPACIDADES**

La Sección 504 de la Ley de Rehabilitación de 1973, con sus modificaciones, prohíbe la discriminación laboral por discapacidad en cualquier programa o actividad que reciba asistencia financiera federal. Queda prohibida la discriminación en todos los aspectos laborales contra las personas discapacitadas que, con o sin adaptaciones razonables, pueden desempeñar las funciones esenciales del trabajo.

Si cree que ha sido víctima de discriminación en algún programa de una institución que reciba asistencia financiera federal, debe comunicarse de inmediato con la agencia federal que brinda dicha asistencia.

# EMPLOYEE RIGHTS UNDER THE FAMILY AND MEDICAL LEAVE ACT

THE UNITED STATES DEPARTMENT OF LABOR WAGE AND HOUR DIVISION

## LEAVE ENTITLEMENTS



Eligible employees who work for a covered employer can take up to 12 weeks of unpaid, job-protected leave in a 12-month period for the following reasons:

- The birth of a child or placement of a child for adoption or foster care;
- To bond with a child (leave must be taken within 1 year of the child's birth or placement);
- To care for the employee's spouse, child, or parent who has a qualifying serious health condition;
- For the employee's own qualifying serious health condition that makes the employee unable to perform the employee's job;
- For qualifying exigencies related to the foreign deployment of a military member who is the employee's spouse, child, or parent.

An eligible employee who is a covered servicemember's spouse, child, parent, or next of kin may also take up to 26 weeks of FMLA leave in a single 12-month period to care for the servicemember with a serious injury or illness.

An employee does not need to use leave in one block. When it is medically necessary or otherwise permitted, employees may take leave intermittently or on a reduced schedule.

Employees may choose, or an employer may require, use of accrued paid leave while taking FMLA leave. If an employee substitutes accrued paid leave for FMLA leave, the employee must comply with the employer's normal paid leave policies.

While employees are on FMLA leave, employers must continue health insurance coverage as if the employees were not on leave.

Upon return from FMLA leave, most employees must be restored to the same job or one nearly identical to it with equivalent pay, benefits, and other employment terms and conditions.

An employer may not interfere with an individual's FMLA rights or retaliate against someone for using or trying to use FMLA leave, opposing any practice made unlawful by the FMLA, or being involved in any proceeding under or related to the FMLA.

An employee who works for a covered employer must meet three criteria in order to be eligible for FMLA leave. The employee must:

- Have worked for the employer for at least 12 months;
- Have at least 1,250 hours of service in the 12 months before taking leave;\* and
- Work at a location where the employer has at least 50 employees within 75 miles of the employee's worksite.

\*Special "hours of service" requirements apply to airline flight crew employees.

Generally, employees must give 30-days' advance notice of the need for FMLA leave. If it is not possible to give 30-days' notice, an employee must notify the employer as soon as possible and, generally, follow the employer's usual procedures.

Employees do not have to share a medical diagnosis, but must provide enough information to the employer so it can determine if the leave qualifies for FMLA protection. Sufficient information could include informing an employer that the employee is or will be unable to perform his or her job functions, that a family member cannot perform daily activities, or that hospitalization or continuing medical treatment is necessary. Employees must inform the employer if the need for leave is for a reason for which FMLA leave was previously taken or certified.

Employers can require a certification or periodic recertification supporting the need for leave. If the employer determines that the certification is incomplete, it must provide a written notice indicating what additional information is required.

Once an employer becomes aware that an employee's need for leave is for a reason that may qualify under the FMLA, the employer must notify the employee if he or she is eligible for FMLA leave and, if eligible, must also provide a notice of rights and responsibilities under the FMLA. If the employee is not eligible, the employer must provide a reason for ineligibility.

Employers must notify its employees if leave will be designated as FMLA leave, and if so, how much leave will be designated as FMLA leave.

Employees may file a complaint with the U.S. Department of Labor, Wage and Hour Division, or may bring a private lawsuit against an employer.

The FMLA does not affect any federal or state law prohibiting discrimination or supersede any state or local law or collective bargaining agreement that provides greater family or medical leave rights.

## BENEFITS & PROTECTIONS

## ELIGIBILITY REQUIREMENTS

## REQUESTING LEAVE

## EMPLOYER RESPONSIBILITIES

## ENFORCEMENT



For additional information or to file a complaint:

**1-866-4-USWAGE**

(1-866-487-9243) TTY: 1-877-889-5627

**www.dol.gov/whd**

U.S. Department of Labor | Wage and Hour Division



# DERECHOS DEL EMPLEADO SEGÚN LA LEY DE AUSENCIA FAMILIAR Y MÉDICA

DIVISIÓN DE HORAS Y SALARIOS DEL DEPARTAMENTO DE EE. UU.

## DE LOS DERECHOS DE LA LICENCIA

Los empleados elegibles que trabajan para un empleador sujeto a esta ley pueden tomarse hasta 12 semanas de licencia sin sueldo sin perder su empleo por las siguientes razones:

- El nacimiento de un hijo o la colocación de un hijo en adopción o en hogar de crianza;
- Para establecer lazos afectivos con un niño (la licencia debe ser tomada dentro del primer año del nacimiento o la colocación del niño);
- Para cuidar al cónyuge del empleado, al hijo, o al padre que tenga un problema de salud serio que califique;
- Debido a un problema de salud serio del mismo empleado que califique y que resulte en que el empleado no pueda realizar su trabajo;
- Por exigencias que califiquen relacionadas con el despliegue de un miembro de las fuerzas armadas que sea cónyuge del empleado, hijo o padre.

Un empleado elegible que es cónyuge, hijo, padre o familiar más cercano del miembro de las fuerzas armadas que está cubierto, puede tomarse hasta 26 semanas de licencia bajo la Ley de Ausencia Familiar y Médica (FMLA, por sus siglas en inglés) en un periodo de 12 meses para cuidar al miembro de las fuerzas armadas que tenga una lesión o enfermedad seria.

Un empleado no tiene que tomarse la licencia de una sola vez. Cuando es médicamente necesario o de otra manera permitido, los empleados pueden tomarse la licencia de forma intermitente o en una jornada reducida.

Los empleados pueden elegir, o un empleador puede exigir, el uso de licencias pagadas acumuladas mientras se toman la licencia bajo la FMLA. Si un empleado sustituye la licencia pagada acumulada por la licencia bajo la FMLA, el empleado tiene que respetar las políticas de pago de licencias normales del empleador.

## BENEFICIOS Y PROTECCIONES

Mientras los empleados estén de licencia bajo la FMLA, los empleadores tienen que continuar con la cobertura del seguro de salud como si los empleados no estuvieran de licencia.

Después de regresar de la licencia bajo la FMLA, a la mayoría de los empleados se les tiene que restablecer el mismo trabajo o uno casi idéntico, con el pago, los beneficios y otros términos y otras condiciones de empleo equivalentes.

Un empleador no puede interferir con los derechos de la FMLA de un individuo o tomar represalias contra alguien por usar o tratar de usar la licencia bajo la FMLA, oponerse a cualquier práctica ilegal hecha por la FMLA, o estar involucrado en un procedimiento según o relacionado con la FMLA.

## REQUISITOS DE ELEGIBILIDAD

Un empleado que trabaja para un empleador cubierto tiene que cumplir con tres criterios para poder ser elegible para una licencia bajo la FMLA. El empleado tiene que:

- Haber trabajado para el empleador por lo menos 12 meses;
- Tener por lo menos 1,250 horas de servicio en los 12 meses previos a tomar la licencia\*; y
- Trabajar en el lugar donde el empleador tiene al menos 50 empleados dentro de 75 millas del lugar de trabajo del empleado.

\*Requisitos especiales de "horas de servicio" se aplican a empleados de una tripulación de una aerolínea.

## PEDIDO DE LA LICENCIA

En general, los empleados tienen que pedir la licencia necesaria bajo la FMLA con 30 días de anticipación. Si no es posible avisar con 30 días de anticipación, un empleado tiene que notificar al empleador lo más pronto posible y, generalmente, seguir los procedimientos usuales del empleador.

Los empleados no tienen que informar un diagnóstico médico, pero tienen que proporcionar información suficiente para que el empleador pueda determinar si la ausencia califica bajo la protección de la FMLA. La información suficiente podría incluir informarle al empleador que el empleado está o estará incapacitado para realizar sus funciones laborales, que un miembro de la familia no puede realizar las actividades diarias, o que una hospitalización o un tratamiento médico es necesario. Los empleados tienen que informar al empleador si la necesidad de la ausencia es por una razón por la cual la licencia bajo la FMLA fue previamente tomada o certificada.

Los empleadores pueden exigir un certificado o una recertificación periódica que respalde la necesidad de la licencia. Si el empleado determina que la certificación está incompleta, tiene que proporcionar un aviso por escrito indicando qué información adicional se requiere.

## RESPONSABILIDADES DEL EMPLEADOR

Una vez que el empleador tome conocimiento que la necesidad de la ausencia del empleado es por una razón que puede calificar bajo la FMLA, el empleador tiene que notificar al empleado si él o ella es elegible para una licencia bajo FMLA y, si es elegible, también tiene que proporcionar un aviso de los derechos y las responsabilidades según la FMLA. Si el empleado no es elegible, el empleador tiene que brindar una razón por la cual no es elegible.

Los empleadores tienen que notificar a sus empleados si la ausencia será designada como licencia bajo la FMLA, y de ser así, cuánta ausencia será designada como licencia bajo la FMLA.

## CUMPLIMIENTO

Los empleados pueden presentar un reclamo ante el Departamento de Trabajo de EE. UU., la División de Horas y Salarios, o pueden presentar una demanda privada contra un empleador.

La FMLA no afecta a ninguna ley federal o estatal que prohíba la discriminación ni sustituye a ninguna ley estatal o local o convenio colectivo de negociación que proporcione mayores derechos de ausencias familiares o médicas.

Para información adicional o para presentar un reclamo:

**1-866-4-USWAGE**

(1-866-487-9243) TTY: 1-877-889-5627

**www.dol.gov/whd**

Departamento de Trabajo de los EE. UU. | División de Horas y Salarios DIVISIÓN DE HORAS Y SALARIOS



# EMPLOYEE RIGHTS UNDER THE FAIR LABOR STANDARDS ACT

THE UNITED STATES DEPARTMENT OF LABOR WAGE AND HOUR DIVISION

## FEDERAL MINIMUM WAGE

# \$7.25

 PER HOUR

BEGINNING JULY 24, 2009

**OVERTIME PAY** At least 1½ times your regular rate of pay for all hours worked over 40 in a workweek.

**CHILD LABOR** An employee must be at least **16** years old to work in most non-farm jobs and at least **18** to work in non-farm jobs declared hazardous by the Secretary of Labor.

Youths **14** and **15** years old may work outside school hours in various non-manufacturing, non-mining, non-hazardous jobs under the following conditions:

**No more than**

- **3** hours on a school day or **18** hours in a school week;
- **8** hours on a non-school day or **40** hours in a non-school week.

Also, work may not begin before **7 a.m.** or end after **7 p.m.**, except from June 1 through Labor Day, when evening hours are extended to **9 p.m.** Different rules apply in agricultural employment.

**TIP CREDIT** Employers of “tipped employees” must pay a cash wage of at least \$2.13 per hour if they claim a tip credit against their minimum wage obligation. If an employee's tips combined with the employer's cash wage of at least \$2.13 per hour do not equal the minimum hourly wage, the employer must make up the difference. Certain other conditions must also be met.

**ENFORCEMENT** The Department of Labor may recover back wages either administratively or through court action, for the employees that have been underpaid in violation of the law. Violations may result in civil or criminal action.

Employers may be assessed civil money penalties of up to \$1,100 for each willful or repeated violation of the minimum wage or overtime pay provisions of the law and up to \$11,000 for each employee who is the subject of a violation of the Act's child labor provisions. In addition, a civil money penalty of up to \$50,000 may be assessed for each child labor violation that causes the death or serious injury of any minor employee, and such assessments may be doubled, up to \$100,000, when the violations are determined to be willful or repeated. The law also prohibits discriminating against or discharging workers who file a complaint or participate in any proceeding under the Act.

### ADDITIONAL INFORMATION

- Certain occupations and establishments are exempt from the minimum wage and/or overtime pay provisions.
- Special provisions apply to workers in American Samoa and the Commonwealth of the Northern Mariana Islands.
- Some state laws provide greater employee protections; employers must comply with both.
- The law requires employers to display this poster where employees can readily see it.
- Employees under 20 years of age may be paid \$4.25 per hour during their first 90 consecutive calendar days of employment with an employer.
- Certain full-time students, student learners, apprentices, and workers with disabilities may be paid less than the minimum wage under special certificates issued by the Department of Labor.

For additional information:



# 1-866-4-USWAGE

(1-866-487-9243)

TTY: 1-877-889-5627



# WWW.WAGEHOUR.DOL.GOV

U.S. Department of Labor | Wage and Hour Division

# DERECHOS DEL EMPLEADO BAJO LA LEY DE NORMAS JUSTAS DE TRABAJO

SECCIÓN DE HORAS Y SUELDOS DEL DEPARTAMENTO DE TRABAJO DE EEUU

## SALARIO MÍNIMO FEDERAL

# \$7.25 POR HORA

A PARTIR DEL 24 DE JULIO DE 2009

### PAGO DE SOBRETIENTO

Por lo menos tiempo y medio (1½) de su tasa regular de pago por todas las horas trabajadas en exceso de 40 en una semana laboral.

### EMPLEO DE MENORES DE EDAD

El empleado ha de tener por lo menos **16 años** de edad para trabajar en la mayoría de los trabajos no agrícolas y por lo menos tener **18 años** para trabajar en trabajos no agrícolas declarados arriesgados por el/la Secretario(a) de Trabajo.

Jóvenes de **14 y 15 años** de edad pueden trabajar fuera de horas escolares en varios trabajos que no sean en fabricación, minería, o arriesgados, bajo las siguientes condiciones:

**No más de**

- 3 horas en un día escolar o 18 horas en una semana escolar;
- 8 horas en un día no escolar o 40 horas en una semana no escolar.

Además, el trabajo no puede empezar antes de las **7 de la mañana** o terminar después de las **7 de la tarde** salvo del primero de junio hasta el Día de Labor, cuando las horas de la tarde se extienden hasta las **9 de la noche**. Se aplican reglas distintas al empleo agrícola.

### CRÉDITO POR PROPINAS

Empresarios de empleados que reciben propinas han de pagar un salario en efectivo de por lo menos \$2.13 por hora si declaran un crédito por propina contra sus obligaciones hacia el salario mínimo. Si las propinas del empleado combinadas con el salario en efectivo que paga el empresario de por lo menos \$2.13 por hora no equivalen al salario mínimo por hora, el empresario ha de suplir la diferencia. También se tiene que cumplir con otras condiciones.

### CUMPLIMIENTO

El Departamento de Trabajo puede recuperar salarios atrasados administrativamente o mediante acción legal en los tribunales, para empleados a los cuales se les haya pagado por debajo y en violación de la ley.

A los empresarios se les puede imponer penas pecuniarias civiles de hasta \$1,100 por cada infracción intencional o repetida de las provisiones de la ley del pago del salario mínimo y del pago de sobretiempos y hasta \$11,000 por cada empleado que sea empleado en violación de las provisiones de la ley sobre el empleo de menores. Adicionalmente, se puede imponer una pena pecuniaria civil de hasta \$50,000 por cada infracción de las provisiones sobre el empleo de menores si causa la muerte o una lesión seria de un empleado menor de edad, y se pueden doblar dichas evaluaciones, hasta \$100,000, cuando se determinan que las infracciones son intencionales o repetidas. La ley también prohíbe la discriminación o el despido del trabajador por haber presentado una denuncia o por participar en cualquier procedimiento bajo la Ley.

### INFORMACIÓN ADICIONAL

- Ciertas ocupaciones y ciertos establecimientos están exentos de las provisiones de pago de salario mínimo y de sobretiempos.
- Se aplican provisiones especiales a trabajadores de Samoa Americana y de la Comunidad de las Islas Marianas del Norte.
- Algunas leyes estatales proveen más protecciones al empleado; el empresario ha de cumplir con ambas.
- La ley exige que los empresarios pongan este cartel donde los empleados lo puedan ver fácilmente.
- A los empleados menores de 20 años de edad se les puede pagar menos de \$4.25 por hora durante los primeros 90 días civiles consecutivos de empleo con un empresario.
- Se les puede pagar menos del salario mínimo bajo ciertos certificados especiales emitidos por el Departamento de Trabajo a ciertos estudiantes de tiempo completo, estudiantes aprendices y a trabajadores con impedimentos.



Para información adicional:

# 1-866-4-USWAGE

(1-866-487-9243) TTY: 1-877-889-5627



# WWW.WAGEHOUR.DOL.GOV

## § 135.1

### APPENDIX TO PART 135

AUTHORITY: 12 U.S.C. 1701u; 42 U.S.C. 3535(d).

SOURCE: 59 FR 33880, June 30, 1994, unless otherwise noted.

EFFECTIVE DATE NOTE: At 59 FR 33880, June 30, 1994, part 135 was revised effective August 1, 1994 through June 30, 1995. At 60 FR 28325, May 31, 1995, the effective period was extended until the final rule implementing changes made to section 3 of the Housing and Urban Development Act of 1968 by the Housing and Community Development Act of 1992 is published and becomes effective.

### Subpart A—General Provisions

#### § 135.1 Purpose.

(a) *Section 3.* The purpose of section 3 of the Housing and Urban Development Act of 1968 (12 U.S.C. 1701u) (section 3) is to ensure that employment and other economic opportunities generated by certain HUD financial assistance shall, to the greatest extent feasible, and consistent with existing Federal, State and local laws and regulations, be directed to low- and very low-income persons, particularly those who are recipients of government assistance for housing, and to business concerns which provide economic opportunities to low- and very low-income persons.

(b) *Part 135.* The purpose of this part is to establish the standards and procedures to be followed to ensure that the objectives of section 3 are met.

#### § 135.2 Effective date of regulation.

The regulations of this part will remain in effect until the date the final rule adopting the regulations of this part with or without changes is published and becomes effective, at which point the final rule will remain in effect.

[60 FR 28326, May 31, 1995]

#### § 135.3 Applicability.

(a) *Section 3 covered assistance.* Section 3 applies to the following HUD assistance (section 3 covered assistance):

(1) *Public and Indian housing assistance.* Section 3 applies to training, employment, contracting and other economic opportunities arising from the

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expenditure of the following public and Indian housing assistance:

(i) Development assistance provided pursuant to section 5 of the U.S. Housing Act of 1937 (1937 Act);

(ii) Operating assistance provided pursuant to section 9 of the 1937 Act; and

(iii) Modernization assistance provided pursuant to section 14 of the 1937 Act;

(2) *Housing and community development assistance.* Section 3 applies to training, employment, contracting and other economic opportunities arising in connection with the expenditure of housing assistance (including section 8 assistance, and including other housing assistance not administered by the Assistant Secretary of Housing) and community development assistance that is used for the following projects;

(i) Housing rehabilitation (including reduction and abatement of lead-based paint hazards, but excluding routine maintenance, repair and replacement);

(ii) Housing construction; and

(iii) Other public construction.

(3) *Thresholds—(i) No thresholds for section 3 covered public and Indian housing assistance.* The requirements of this part apply to section 3 covered assistance provided to recipients, notwithstanding the amount of the assistance provided to the recipient. The requirements of this part apply to all contractors and subcontractors performing work in connection with projects and activities funded by public and Indian housing assistance covered by section 3, regardless of the amount of the contract or subcontract.

(ii) *Thresholds for section 3 covered housing and community development assistance—(A) Recipient thresholds.* The requirements of this part apply to recipients of other housing and community development program assistance for a section 3 covered project(s) for which the amount of the assistance exceeds \$200,000.

(B) *Contractor and subcontractor thresholds.* The requirements of this part apply to contractors and subcontractors performing work on section 3 covered project(s) for which the amount of the assistance exceeds \$200,000; and the contract or subcontract exceeds \$100,000.

(C) *Threshold met for recipients, but not contractors or subcontractors.* If a recipient receives section 3 covered housing or community development assistance in excess of \$200,000, but no contract exceeds \$100,000, the section 3 preference requirements only apply to the recipient.

(b) *Applicability of section 3 to entire project or activity funded with section 3 assistance.* The requirements of this part apply to the entire project or activity that is funded with section 3 covered assistance, regardless of whether the section 3 activity is fully or partially funded with section 3 covered assistance.

(c) *Applicability to Indian housing authorities and Indian tribes.* Indian housing authorities and tribes that receive HUD assistance described in paragraph (a) of this section shall comply with the procedures and requirements of this part to the maximum extent consistent with, but not in derogation of, compliance with section 7(b) of the Indian Self-Determination and Education Assistance Act (25 U.S.C. 450e(b)). (See 24 CFR part 905.)

(d) *Other HUD assistance and other Federal assistance.* Recipients, contractors and subcontractors that receive HUD assistance, not listed in paragraph (a) of this section, or other Federal assistance, are encouraged to provide, to the greatest extent feasible, training, employment, and contracting opportunities generated by the expenditure of this assistance to low- and very low-income persons, and business concerns owned by low- and very low-income persons, or which employ low- and very low-income persons.

#### § 135.5 Definitions.

The terms *Department*, *HUD*, *Indian housing authority (IHA)*, *Public housing agency (PHA)*, and *Secretary* are defined in 24 CFR part 5.

*Annual Contributions Contract (ACC)* means the contract under the U.S. Housing Act of 1937 (1937 Act) between HUD and the PHA, or between HUD and the IHA, that contains the terms and conditions under which HUD assists the PHA or the IHA in providing decent, safe, and sanitary housing for low income families. The ACC must be in a form prescribed by HUD under

which HUD agrees to provide assistance in the development, modernization and/or operation of a low income housing project under the 1937 Act, and the PHA or IHA agrees to develop, modernize and operate the project in compliance with all provisions of the ACC and the 1937 Act, and all HUD regulations and implementing requirements and procedures. (The ACC is not a form of procurement contract.)

*Applicant* means any entity which makes an application for section 3 covered assistance, and includes, but is not limited to, any State, unit of local government, public housing agency, Indian housing authority, Indian tribe, or other public body, public or private nonprofit organization, private agency or institution, mortgagor, developer, limited dividend sponsor, builder, property manager, community housing development organization (CHDO), resident management corporation, resident council, or cooperative association.

*Assistant Secretary* means the Assistant Secretary for Fair Housing and Equal Opportunity.

*Business concern* means a business entity formed in accordance with State law, and which is licensed under State, county or municipal law to engage in the type of business activity for which it was formed.

*Business concern that provides economic opportunities for low- and very low-income persons.* See definition of "section 3 business concern" in this section.

*Contract.* See the definition of "section 3 covered contract" in this section.

*Contractor* means any entity which contracts to perform work generated by the expenditure of section 3 covered assistance, or for work in connection with a section 3 covered project.

*Employment opportunities generated by section 3 covered assistance* means all employment opportunities generated by the expenditure of section 3 covered public and Indian housing assistance (i.e., operating assistance, development assistance and modernization assistance, as described in §135.3(a)(1)). With respect to section 3 covered housing and community development assistance, this term means all employment opportunities arising in connection

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with section 3 covered projects (as described in §135.3(a)(2)), including management and administrative jobs connected with the section 3 covered project. Management and administrative jobs include architectural, engineering or related professional services required to prepare plans, drawings, specifications, or work write-ups; and jobs directly related to administrative support of these activities, e.g., construction manager, relocation specialist, payroll clerk, etc.

*Housing authority (HA)* means, collectively, public housing agency and Indian housing authority.

*Housing and community development assistance* means any financial assistance provided or otherwise made available through a HUD housing or community development program through any grant, loan, loan guarantee, cooperative agreement, or contract, and includes community development funds in the form of community development block grants, and loans guaranteed under section 108 of the Housing and Community Development Act of 1974, as amended. Housing and community development assistance does not include financial assistance provided through a contract of insurance or guaranty.

*Housing development* means low-income housing owned, developed, or operated by public housing agencies or Indian housing authorities in accordance with HUD's public and Indian housing program regulations codified in 24 CFR Chapter IX.

*HUD Youthbuild programs* mean programs that receive assistance under subtitle D of Title IV of the National Affordable Housing Act, as amended by the Housing and Community Development Act of 1992 (42 U.S.C. 12899), and provide disadvantaged youth with opportunities for employment, education, leadership development, and training in the construction or rehabilitation of housing for homeless individuals and members of low- and very low-income families.

*Indian tribes* shall have the meaning given this term in 24 CFR part 571.

*JTPA* means the Job Training Partnership Act (29 U.S.C. 1579(a)).

*Low-income person.* See the definition of "section 3 resident" in this section.

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*Metropolitan area* means a metropolitan statistical area (MSA), as established by the Office of Management and Budget.

*Neighborhood area* means:

(1) For HUD housing programs, a geographical location within the jurisdiction of a unit of general local government (but not the entire jurisdiction) designated in ordinances, or other local documents as a neighborhood, village, or similar geographical designation.

(2) For HUD community development programs, see the definition, if provided, in the regulations for the applicable community development program, or the definition for this term in 24 CFR 570.204(c)(1).

*New hires* mean full-time employees for permanent, temporary or seasonal employment opportunities.

*Nonmetropolitan county* means any county outside of a metropolitan area.

*Other HUD programs* means HUD programs, other than HUD public and Indian housing programs, that provide housing and community development assistance for "section 3 covered projects," as defined in this section.

*Public housing resident* has the meaning given this term in 24 CFR part 963.

*Recipient* means any entity which receives section 3 covered assistance, directly from HUD or from another recipient and includes, but is not limited to, any State, unit of local government, PHA, IHA, Indian tribe, or other public body, public or private nonprofit organization, private agency or institution, mortgagor, developer, limited dividend sponsor, builder, property manager, community housing development organization, resident management corporation, resident council, or cooperative association. Recipient also includes any successor, assignee or transferee of any such entity, but does not include any ultimate beneficiary under the HUD program to which section 3 applies and does not include contractors.

*Section 3* means section 3 of the Housing and Urban Development Act of 1968, as amended (12 U.S.C. 1701u).

*Section 3 business concern* means a business concern, as defined in this section—

(1) That is 51 percent or more owned by section 3 residents; or



(2) Whose permanent, full-time employees include persons, at least 30 percent of whom are currently section 3 residents, or within three years of the date of first employment with the business concern were section 3 residents; or

(3) That provides evidence of a commitment to subcontract in excess of 25 percent of the dollar award of all subcontracts to be awarded to business concerns that meet the qualifications set forth in paragraphs (1) or (2) in this definition of "section 3 business concern."

*Section 3 clause* means the contract provisions set forth in §135.38.

*Section 3 covered activity* means any activity which is funded by section 3 covered assistance public and Indian housing assistance.

*Section 3 covered assistance* means: (1) Public and Indian housing development assistance provided pursuant to section 5 of the 1937 Act;

(2) Public and Indian housing operating assistance provided pursuant to section 9 of the 1937 Act;

(3) Public and Indian housing modernization assistance provided pursuant to section 14 of the 1937 Act;

(4) Assistance provided under any HUD housing or community development program that is expended for work arising in connection with:

(i) Housing rehabilitation (including reduction and abatement of lead-based paint hazards, but excluding routine maintenance, repair and replacement);

(ii) Housing construction; or

(iii) Other public construction project (which includes other buildings or improvements, regardless of ownership).

*Section 3 covered contract* means a contract or subcontract (including a professional service contract) awarded by a recipient or contractor for work generated by the expenditure of section 3 covered assistance, or for work arising in connection with a section 3 covered project. "Section 3 covered contracts" do not include contracts awarded under HUD's procurement program, which are governed by the Federal Acquisition Regulation System (see 48 CFR, Chapter 1). "Section 3 covered contracts" also do not include contracts for the purchase of supplies and

materials. However, whenever a contract for materials includes the installation of the materials, the contract constitutes a section 3 covered contract. For example, a contract for the purchase and installation of a furnace would be a section 3 covered contract because the contract is for work (i.e., the installation of the furnace) and thus is covered by section 3.

*Section 3 covered project* means the construction, reconstruction, conversion or rehabilitation of housing (including reduction and abatement of lead-based paint hazards), other public construction which includes buildings or improvements (regardless of ownership) assisted with housing or community development assistance.

*Section 3 joint venture.* See §135.40. *Section 3 resident* means: (1) A public housing resident; or

(2) An individual who resides in the metropolitan area or nonmetropolitan county in which the section 3 covered assistance is expended, and who is:

(i) A *low-income person*, as this term is defined in section 3(b)(2) of the 1937 Act (42 U.S.C. 1437a(b)(2)). Section 3(b)(2) of the 1937 Act defines this term to mean families (including single persons) whose incomes do not exceed 80 per centum of the median income for the area, as determined by the Secretary, with adjustments for smaller and larger families, except that the Secretary may establish income ceilings higher or lower than 80 per centum of the median for the area on the basis of the Secretary's findings that such variations are necessary because of prevailing levels of construction costs or unusually high or low-income families; or

(ii) A *very low-income person*, as this term is defined in section 3(b)(2) of the 1937 Act (42 U.S.C. 1437a(b)(2)). Section 3(b)(2) of the 1937 Act (42 U.S.C. 1437a(b)(2)) defines this term to mean families (including single persons) whose incomes do not exceed 50 per centum of the median family income for the area, as determined by the Secretary with adjustments for smaller and larger families, except that the Secretary may establish income ceilings higher or lower than 50 per centum of the median for the area on the basis of the Secretary's findings that

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such variations are necessary because of unusually high or low family incomes.

(3) A person seeking the training and employment preference provided by section 3 bears the responsibility of providing evidence (if requested) that the person is eligible for the preference.

*Section 8 assistance* means assistance provided under section 8 of the 1937 Act (42 U.S.C. 1437f) pursuant to 24 CFR part 882, subpart G.

*Service area* means the geographical area in which the persons benefitting from the section 3 covered project reside. The service area shall not extend beyond the unit of general local government in which the section 3 covered assistance is expended. In HUD's Indian housing programs, the service area, for IHAs established by an Indian tribe as a result of the exercise of the tribe's sovereign power, is limited to the area of tribal jurisdiction.

*Subcontractor* means any entity (other than a person who is an employee of the contractor) which has a contract with a contractor to undertake a portion of the contractor's obligation for the performance of work generated by the expenditure of section 3 covered assistance, or arising in connection with a section 3 covered project.

*Very low-income person.* See the definition of "section 3 resident" in this section.

*Youthbuild programs.* See the definition of "HUD Youthbuild programs" in this section.

[59 FR 33880, June 30, 1994, as amended at 61 FR 5206, Feb. 9, 1996]

### § 135.7 Delegation of authority.

Except as may be otherwise provided in this part, the functions and responsibilities of the Secretary under section 3, and described in this part, are delegated to the Assistant Secretary for Fair Housing and Equal Opportunity. The Assistant Secretary is further authorized to redelegate functions and responsibilities to other employees of HUD; *provided however*, that the authority to issue rules and regulations under this part, which authority is delegated to the Assistant Secretary, may

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not be redelegated by the Assistant Secretary.

### § 135.9 Requirements applicable to HUD NOFAs for section 3 covered programs.

(a) *Certification of compliance with part 135.* All notices of funding availability (NOFAs) issued by HUD that announce the availability of funding covered by section 3 shall include a provision in the NOFA that notifies applicants that section 3 and the regulations in part 135 are applicable to funding awards made under the NOFA. Additionally the NOFA shall require as an application submission requirement (which may be specified in the NOFA or application kit) a certification by the applicant that the applicant will comply with the regulations in part 135. (For PHAs, this requirement will be met where a PHA Resolution in Support of the Application is submitted.) With respect to application evaluation, HUD will accept an applicant's certification unless there is evidence substantially challenging the certification.

(b) *Statement of purpose in NOFAs.* (1) For competitively awarded assistance in which the grants are for activities administered by an HA, and those activities are anticipated to generate significant training, employment or contracting opportunities, the NOFA must include a statement that one of the purposes of the assistance is to give to the greatest extent feasible, and consistent with existing Federal, State and local laws and regulations, job training, employment, contracting and other economic opportunities to section 3 residents and section 3 business concerns.

(2) For competitively awarded assistance involving housing rehabilitation, construction or other public construction, where the amount awarded to the applicant may exceed \$200,000, the NOFA must include a statement that one of the purposes of the assistance is to give, to the greatest extent feasible, and consistent with existing Federal, State and local laws and regulations, job training, employment, contracting and other economic opportunities to section 3 residents and section 3 business concerns.

(c) *Section 3 as NOFA evaluation criteria.* Where not otherwise precluded by statute, in the evaluation of applications for the award of assistance, consideration shall be given to the extent to which an applicant has demonstrated that it will train and employ section 3 residents and contract with section 3 business concerns for economic opportunities generated in connection with the assisted project or activity. The evaluation criteria to be utilized, and the rating points to be assigned, will be specified in the NOFA.

**§ 135.11 Other laws governing training, employment, and contracting.**

Other laws and requirements that are applicable or may be applicable to the economic opportunities generated from the expenditure of section 3 covered assistance include, but are not necessarily limited to those listed in this section.

(a) *Procurement standards for States and local governments (24 CFR 85.36)*—(1) *General.* Nothing in this part 135 prescribes specific methods of procurement. However, neither section 3 nor the requirements of this part 135 supersede the general requirement of 24 CFR 85.36(c) that all procurement transactions be conducted in a competitive manner. Consistent with 24 CFR 85.36(c)(2), section 3 is a Federal statute that expressly encourages, to the maximum extent feasible, a geographic preference in the evaluation of bids or proposals.

(2) *Flexible Subsidy Program.* Multifamily project mortgagors in the Flexible Subsidy Program are not required to utilize the methods of procurement in 24 CFR 85.36(d), and are not permitted to utilize methods of procurement that would result in their award of a contract to a business concern that submits a bid higher than the lowest responsive bid. A multifamily project mortgagor, however, must ensure that, to the greatest extent feasible, the procurement practices it selects provide preference to section 3 business concerns.

(b) *Procurement standards for other recipients (OMB Circular No. A-110).* Nothing in this part prescribes specific methods of procurement for grants and other agreements with institutions of

higher education, hospitals, and other nonprofit organizations. Consistent with the requirements set forth in OMB Circular No. A-110, section 3 is a Federal statute that expressly encourages a geographic preference in the evaluation of bids or proposals.

(c) *Federal labor standards provisions.* Certain construction contracts are subject to compliance with the requirement to pay prevailing wages determined under Davis-Bacon Act (40 U.S.C. 276a-276a-7) and implementing U.S. Department of Labor regulations in 29 CFR part 5. Additionally, certain HUD-assisted rehabilitation and maintenance activities on public and Indian housing developments are subject to compliance with the requirement to pay prevailing wage rates, as determined or adopted by HUD, to laborers and mechanics employed in this work. Apprentices and trainees may be utilized on this work only to the extent permitted under either Department of Labor regulations at 29 CFR part 5 or for work subject to HUD-determined prevailing wage rates, HUD policies and guidelines. These requirements include adherence to the wage rates and ratios of apprentices or trainees to journeymen set out in "approved apprenticeship and training programs," as described in paragraph (d) of this section.

(d) *Approved apprenticeship and trainee programs.* Certain apprenticeship and trainee programs have been approved by various Federal agencies. Approved apprenticeship and trainee programs include: an apprenticeship program approved by the Bureau of Apprenticeship and Training of the Department of Labor, or a State Apprenticeship Agency, or an on-the-job training program approved by the Bureau of Apprenticeship and Training, in accordance with the regulations at 29 CFR part 5; or a training program approved by HUD in accordance with HUD policies and guidelines, as applicable. Participation in an approved apprenticeship program does not, in and of itself, demonstrate compliance with the regulations of this part.

(e) *Compliance with Executive Order 11246.* Certain contractors covered by this part are subject to compliance with Executive Order 11246, as amended

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by Executive Order 12086, and the Department of Labor regulations issued pursuant thereto (41 CFR chapter 60) which provide that no person shall be discriminated against on the basis of race, color, religion, sex, or national origin in all phases of employment during the performance of Federal or Federally assisted construction contracts.

### Subpart B—Economic Opportunities for Section 3 Residents and Section 3 Business Concerns

#### § 135.30 Numerical goals for meeting the greatest extent feasible requirement.

(a) *General.* (1) Recipients and covered contractors may demonstrate compliance with the “greatest extent feasible” requirement of section 3 by meeting the numerical goals set forth in this section for providing training, employment, and contracting opportunities to section 3 residents and section 3 business concerns.

(2) The goals established in this section apply to the entire amount of section 3 covered assistance awarded to a recipient in any Federal Fiscal Year (FY), commencing with the first FY following the effective date of this rule.

(3) For recipients that do not engage in training, or hiring, but award contracts to contractors that will engage in training, hiring, and subcontracting, recipients must ensure that, to the greatest extent feasible, contractors will provide training, employment, and contracting opportunities to section 3 residents and section 3 business concerns.

(4) The numerical goals established in this section represent minimum numerical targets.

(b) *Training and employment.* The numerical goals set forth in paragraph (b) of this section apply to new hires. The numerical goals reflect the aggregate hires. Efforts to employ section 3 residents, to the greatest extent feasible, should be made at all job levels.

(1) *Numerical goals for section 3 covered public and Indian housing programs.* Recipients of section 3 covered public and Indian housing assistance (as described in §135.5) and their contractors and

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subcontractors may demonstrate compliance with this part by committing to employ section 3 residents as:

(i) 10 percent of the aggregate number of new hires for the one year period beginning in FY 1995;

(ii) 20 percent of the aggregate number of new hires for the one period beginning in FY 1996;

(iii) 30 percent of the aggregate number of new hires for one year period beginning in FY 1997 and continuing thereafter.

(2) *Numerical goals for other HUD programs covered by section 3.* (i) Recipients of section 3 covered housing assistance provided under other HUD programs, and their contractors and subcontractors (unless the contract or subcontract awards do not meet the threshold specified in §135.3(a)(3)) may demonstrate compliance with this part by committing to employ section 3 residents as 10 percent of the aggregate number of new hires for each year over the duration of the section 3 project;

(ii) Where a managing general partner or management agent is affiliated, in a given metropolitan area, with recipients of section 3 covered housing assistance, for an aggregate of 500 or more units in any fiscal year, the managing partner or management agent may demonstrate compliance with this part by committing to employ section 3 residents as:

(A) 10 percent of the aggregate number of new hires for the one year period beginning in FY 1995;

(B) 20 percent of the aggregate number of new hires for the one year period beginning in FY 1996;

(C) 30 percent of the aggregate number of new hires for the one year period beginning in FY 1997, and continuing thereafter.

(3) Recipients of section 3 covered community development assistance, and their contractors and subcontractors (unless the contract or subcontract awards do not meet the threshold specified in §135.3(a)(3)) may demonstrate compliance with the requirements of this part by committing to employ section 3 residents as:

(i) 10 percent of the aggregate number of new hires for the one year period beginning in FY 1995;

(ii) 20 percent of the aggregate number of new hires for the one year period beginning in FY 1996; and

(iii) 30 percent of the aggregate number of new hires for the one year period beginning in FY 1997 and continuing thereafter.

(c) *Contracts.* Numerical goals set forth in paragraph (c) of this section apply to contracts awarded in connection with all section 3 covered projects and section 3 covered activities. Each recipient and contractor and subcontractor (unless the contract or subcontract awards do not meet the threshold specified in §135.3(a)(3)) may demonstrate compliance with the requirements of this part by committing to award to section 3 business concerns:

(1) At least 10 percent of the total dollar amount of all section 3 covered contracts for building trades work for maintenance, repair, modernization or development of public or Indian housing, or for building trades work arising in connection with housing rehabilitation, housing construction and other public construction; and

(2) At least three (3) percent of the total dollar amount of all other section 3 covered contracts.

(d) *Safe harbor and compliance determinations.* (1) In the absence of evidence to the contrary, a recipient that meets the minimum numerical goals set forth in this section will be considered to have complied with the section 3 preference requirements.

(2) In evaluating compliance under subpart D of this part, a recipient that has not met the numerical goals set forth in this section has the burden of demonstrating why it was not feasible to meet the numerical goals set forth in this section. Such justification may include impediments encountered despite actions taken. A recipient or contractor also can indicate other economic opportunities, such as those listed in §135.40, which were provided in its efforts to comply with section 3 and the requirements of this part.

#### § 135.32 Responsibilities of the recipient.

Each recipient has the responsibility to comply with section 3 in its own operations, and ensure compliance in the

operations of its contractors and subcontractors. This responsibility includes but may not be necessarily limited to:

(a) Implementing procedures designed to notify section 3 residents about training and employment opportunities generated by section 3 covered assistance and section 3 business concerns about contracting opportunities generated by section 3 covered assistance;

(b) Notifying potential contractors for section 3 covered projects of the requirements of this part, and incorporating the section 3 clause set forth in §135.38 in all solicitations and contracts.

(c) Facilitating the training and employment of section 3 residents and the award of contracts to section 3 business concerns by undertaking activities such as described in the Appendix to this part, as appropriate, to reach the goals set forth in §135.30. Recipients, at their own discretion, may establish reasonable numerical goals for the training and employment of section 3 residents and contract award to section 3 business concerns that exceed those specified in §135.30;

(d) Assisting and actively cooperating with the Assistant Secretary in obtaining the compliance of contractors and subcontractors with the requirements of this part, and refraining from entering into any contract with any contractor where the recipient has notice or knowledge that the contractor has been found in violation of the regulations in 24 CFR part 135.

(e) Documenting actions taken to comply with the requirements of this part, the results of actions taken and impediments, if any.

(f) A State or county which distributes funds for section 3 covered assistance to units of local governments, to the greatest extent feasible, must attempt to reach the numerical goals set forth in §135.30 regardless of the number of local governments receiving funds from the section 3 covered assistance which meet the thresholds for applicability set forth at 135.3. The State or county must inform units of local government to whom funds are distributed of the requirements of this part; assist

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local governments and their contractors in meeting the requirements and objectives of this part; and monitor the performance of local governments with respect to the objectives and requirements of this part.

#### **§ 135.34 Preference for section 3 residents in training and employment opportunities.**

(a) *Order of providing preference.* Recipients, contractors and subcontractors shall direct their efforts to provide, to the greatest extent feasible, training and employment opportunities generated from the expenditure of section 3 covered assistance to section 3 residents in the order of priority provided in paragraph (a) of this section.

(1) *Public and Indian housing programs.* In public and Indian housing programs, efforts shall be directed to provide training and employment opportunities to section 3 residents in the following order of priority:

(i) Residents of the housing development or developments for which the section 3 covered assistance is expended (category 1 residents);

(ii) Residents of other housing developments managed by the HA that is expending the section 3 covered housing assistance (category 2 residents);

(iii) Participants in HUD Youthbuild programs being carried out in the metropolitan area (or nonmetropolitan county) in which the section 3 covered assistance is expended (category 3 residents);

(iv) Other section 3 residents.

(2) *Housing and community development programs.* In housing and community development programs, priority consideration shall be given, where feasible, to:

(i) Section 3 residents residing in the service area or neighborhood in which the section 3 covered project is located (collectively, referred to as category 1 residents); and

(ii) Participants in HUD Youthbuild programs (category 2 residents).

(iii) Where the section 3 project is assisted under the Stewart B. McKinney Homeless Assistance Act (42 U.S.C. 11301 *et seq.*), homeless persons residing in the service area or neighborhood in which the section 3 covered project is

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located shall be given the highest priority;

(iv) Other section 3 residents.

(3) Recipients of housing assistance programs administered by the Assistant Secretary for Housing may, at their own discretion, provide preference to residents of the housing development receiving the section 3 covered assistance within the service area or neighborhood where the section 3 covered project is located.

(4) Recipients of community development programs may, at their own discretion, provide priority to recipients of government assistance for housing, including recipients of certificates or vouchers under the Section 8 housing assistance program, within the service area or neighborhood where the section 3 covered project is located.

(b) *Eligibility for preference.* A section 3 resident seeking the preference in training and employment provided by this part shall certify, or submit evidence to the recipient contractor or subcontractor, if requested, that the person is a section 3 resident, as defined in § 135.5. (An example of evidence of eligibility for the preference is evidence of receipt of public assistance, or evidence of participation in a public assistance program.)

(c) *Eligibility for employment.* Nothing in this part shall be construed to require the employment of a section 3 resident who does not meet the qualifications of the position to be filled.

#### **§ 135.36 Preference for section 3 business concerns in contracting opportunities.**

(a) *Order of providing preference.* Recipients, contractors and subcontractors shall direct their efforts to award section 3 covered contracts, to the greatest extent feasible, to section 3 business concerns in the order of priority provided in paragraph (a) of this section.

(1) *Public and Indian housing programs.* In public and Indian housing programs, efforts shall be directed to award contracts to section 3 business concerns in the following order of priority:

(i) Business concerns that are 51 percent or more owned by residents of the housing development or developments

for which the section 3 covered assistance is expended, or whose full-time, permanent workforce includes 30 percent of these persons as employees (category 1 businesses);

(ii) Business concerns that are 51 percent or more owned by residents of other housing developments or developments managed by the HA that is expending the section 3 covered assistance, or whose full-time, permanent workforce includes 30 percent of these persons as employees (category 2 businesses); or

(iii) HUD Youthbuild programs being carried out in the metropolitan area (or nonmetropolitan county) in which the section 3 covered assistance is expended (category 3 businesses).

(iv) Business concerns that are 51 percent or more owned by section 3 residents, or whose permanent, full-time workforce includes no less than 30 percent section 3 residents (category 4 businesses), or that subcontract in excess of 25 percent of the total amount of subcontracts to business concerns identified in paragraphs (a)(1)(i) and (a)(1)(ii) of this section.

(2) *Housing and community development programs.* In housing and community development programs, priority consideration shall be given, where feasible, to:

(i) Section 3 business concerns that provide economic opportunities for section 3 residents in the service area or neighborhood in which the section 3 covered project is located (category 1 businesses); and

(ii) Applicants (as this term is defined in 42 U.S.C. 12899) selected to carry out HUD Youthbuild programs (category 2 businesses);

(iii) Other section 3 business concerns.

(b) *Eligibility for preference.* A business concern seeking to qualify for a section 3 contracting preference shall certify or submit evidence, if requested, that the business concern is a section 3 business concern as defined in § 135.5.

(c) *Ability to complete contract.* A section 3 business concern seeking a contract or a subcontract shall submit evidence to the recipient, contractor, or subcontractor (as applicable), if requested, sufficient to demonstrate to the satisfaction of the party awarding

the contract that the business concern is responsible and has the ability to perform successfully under the terms and conditions of the proposed contract. (The ability to perform successfully under the terms and conditions of the proposed contract is required of all contractors and subcontractors subject to the procurement standards of 24 CFR 85.36 (see 24 CFR 85.36(b)(8)).) This regulation requires consideration of, among other factors, the potential contractor's record in complying with public policy requirements. Section 3 compliance is a matter properly considered as part of this determination.

#### § 135.38 Section 3 clause.

All section 3 covered contracts shall include the following clause (referred to as the section 3 clause):

A. The work to be performed under this contract is subject to the requirements of section 3 of the Housing and Urban Development Act of 1968, as amended, 12 U.S.C. 1701u (section 3). The purpose of section 3 is to ensure that employment and other economic opportunities generated by HUD assistance or HUD-assisted projects covered by section 3, shall, to the greatest extent feasible, be directed to low- and very low-income persons, particularly persons who are recipients of HUD assistance for housing.

B. The parties to this contract agree to comply with HUD's regulations in 24 CFR part 135, which implement section 3. As evidenced by their execution of this contract, the parties to this contract certify that they are under no contractual or other impediment that would prevent them from complying with the part 135 regulations.

C. The contractor agrees to send to each labor organization or representative of workers with which the contractor has a collective bargaining agreement or other understanding, if any, a notice advising the labor organization or workers' representative of the contractor's commitments under this section 3 clause, and will post copies of the notice in conspicuous places at the work site where both employees and applicants for training and employment positions can see the notice. The notice shall describe the section 3 preference, shall set forth minimum number and job titles subject to hire, availability of apprenticeship and training positions, the qualifications for each; and the name and location of the person(s) taking applications for each of the positions; and the anticipated date the work shall begin.

D. The contractor agrees to include this section 3 clause in every subcontract subject to compliance with regulations in 24 CFR

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part 135, and agrees to take appropriate action, as provided in an applicable provision of the subcontract or in this section 3 clause, upon a finding that the subcontractor is in violation of the regulations in 24 CFR part 135. The contractor will not subcontract with any subcontractor where the contractor has notice or knowledge that the subcontractor has been found in violation of the regulations in 24 CFR part 135.

E. The contractor will certify that any vacant employment positions, including training positions, that are filled (1) after the contractor is selected but before the contract is executed, and (2) with persons other than those to whom the regulations of 24 CFR part 135 require employment opportunities to be directed, were not filled to circumvent the contractor's obligations under 24 CFR part 135.

F. Noncompliance with HUD's regulations in 24 CFR part 135 may result in sanctions, termination of this contract for default, and debarment or suspension from future HUD assisted contracts.

G. With respect to work performed in connection with section 3 covered Indian housing assistance, section 7(b) of the Indian Self-Determination and Education Assistance Act (25 U.S.C. 450e) also applies to the work to be performed under this contract. Section 7(b) requires that to the greatest extent feasible (i) preference and opportunities for training and employment shall be given to Indians, and (ii) preference in the award of contracts and subcontracts shall be given to Indian organizations and Indian-owned Economic Enterprises. Parties to this contract that are subject to the provisions of section 3 and section 7(b) agree to comply with section 3 to the maximum extent feasible, but not in derogation of compliance with section 7(b).

### § 135.40 Providing other economic opportunities.

(a) *General.* In accordance with the findings of the Congress, as stated in section 3, that other economic opportunities offer an effective means of empowering low-income persons, a recipient is encouraged to undertake efforts to provide to low-income persons economic opportunities other than training, employment, and contract awards, in connection with section 3 covered assistance.

(b) *Other training and employment related opportunities.* Other economic opportunities to train and employ section 3 residents include, but need not be limited to, use of "upward mobility", "bridge" and trainee positions to fill vacancies; hiring section 3 residents in

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management and maintenance positions within other housing developments; and hiring section 3 residents in part-time positions.

(c) *Other business related economic opportunities.* (1) A recipient or contractor may provide economic opportunities to establish, stabilize or expand section 3 business concerns, including micro-enterprises. Such opportunities include, but are not limited to the formation of section 3 joint ventures, financial support for affiliating with franchise development, use of labor only contracts for building trades, purchase of supplies and materials from housing authority resident-owned businesses, purchase of materials and supplies from PHA resident-owned businesses and use of procedures under 24 CFR part 963 regarding HA contracts to HA resident-owned businesses. A recipient or contractor may employ these methods directly or may provide incentives to non-section 3 businesses to utilize such methods to provide other economic opportunities to low-income persons.

(2) A *section 3 joint venture* means an association of business concerns, one of which qualifies as a section 3 business concern, formed by written joint venture agreement to engage in and carry out a specific business venture for which purpose the business concerns combine their efforts, resources, and skills for joint profit, but not necessarily on a continuing or permanent basis for conducting business generally, and for which the section 3 business concern:

(i) Is responsible for a clearly defined portion of the work to be performed and holds management responsibilities in the joint venture; and

(ii) Performs at least 25 percent of the work and is contractually entitled to compensation proportionate to its work.

### Subpart C [Reserved]

### Subpart D—Complaint and Compliance Review

#### § 135.70 General.

(a) *Purpose.* The purpose of this subpart is to establish the procedures for handling complaints alleging non-compliance with the regulations of this



part, and the procedures governing the Assistant Secretary's review of a recipient's or contractor's compliance with the regulations in this part.

(b) *Definitions.* For purposes of this subpart:

(1) *Complaint* means an allegation of noncompliance with regulations of this part made in the form described in §135.76(d).

(2) *Complainant* means the party which files a complaint with the Assistant Secretary alleging that a recipient or contractor has failed or refused to comply with the regulations in this part.

(3) *Noncompliance with section 3* means failure by a recipient or contractor to comply with the requirements of this part.

(4) *Respondent* means the recipient or contractor against which a complaint of noncompliance has been filed. The term "recipient" shall have the meaning set forth in §135.7, which includes PHA and IHA.

**§ 135.72 Cooperation in achieving compliance.**

(a) The Assistant Secretary recognizes that the success of ensuring that section 3 residents and section 3 business concerns have the opportunity to apply for jobs and to bid for contracts generated by covered HUD financial assistance depends upon the cooperation and assistance of HUD recipients and their contractors and subcontractors. All recipients shall cooperate fully and promptly with the Assistant Secretary in section 3 compliance reviews, in investigations of allegations of noncompliance made under §135.76, and with the distribution and collection of data and information that the Assistant Secretary may require in connection with achieving the economic objectives of section 3.

(b) The recipient shall refrain from entering into a contract with any contractor after notification to the recipient by HUD that the contractor has been found in violation of the regulations in this part. The provisions of 24 CFR part 24 apply to the employment, engagement of services, awarding of contracts or funding of any contractors or subcontractors during any period of

debarment, suspension or otherwise ineligible status.

**§ 135.74 Section 3 compliance review procedures.**

(a) *Compliance reviews by Assistant Secretary.* The Assistant Secretary shall periodically conduct section 3 compliance reviews of selected recipients and contractors to determine whether these recipients are in compliance with the regulations in this part.

(b) *Form of compliance review.* A section 3 compliance review shall consist of a comprehensive analysis and evaluation of the recipient's or contractor's compliance with the requirements and obligations imposed by the regulations of this part, including an analysis of the extent to which section 3 residents have been hired and section 3 business concerns have been awarded contracts as a result of the methods undertaken by the recipient to achieve the employment, contracting and other economic objectives of section 3.

(c) *Where compliance review reveals noncompliance with section 3 by recipient or contractor.* Where the section 3 compliance review reveals that a recipient or contractor has not complied with section 3, the Assistant Secretary shall notify the recipient or contractor of its specific deficiencies in compliance with the regulations of this part, and shall advise the recipient or contractor of the means by which these deficiencies may be corrected. HUD shall conduct a follow-up review with the recipient or contractor to ensure that action is being taken to correct the deficiencies.

(d) *Continuing noncompliance by recipient or contractor.* A continuing failure or refusal by the recipient or contractor to comply with the regulations in this part may result in the application of sanctions specified in the contract through which HUD assistance is provided, or the application of sanctions specified in the regulations governing the HUD program under which HUD financial assistance is provided. HUD will notify the recipient of any continuing failure or refusal by the contractor to comply with the regulations in this part for possible action under any procurement contract between the recipient and the contractor.

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Debarment, suspension and limited denial of participation pursuant to HUD's regulations in 24 CFR part 24, where appropriate, may be applied to the recipient or the contractor.

(e) *Conducting compliance review before the award of assistance.* Section 3 compliance reviews may be conducted before the award of contracts, and especially where the Assistant Secretary has reasonable grounds to believe that the recipient or contractor will be unable or unwilling to comply with the regulations in this part.

(f) *Consideration of complaints during compliance review.* Complaints alleging noncompliance with section 3, as provided in § 135.76, may also be considered during any compliance review conducted to determine the recipient's conformance with regulations in this part.

### § 135.76 Filing and processing complaints.

(a) *Who may file a complaint.* The following individuals and business concerns may, personally or through an authorized representative, file with the Assistant Secretary a complaint alleging noncompliance with section 3:

(1) Any section 3 resident on behalf of himself or herself, or as a representative of persons similarly situated, seeking employment, training or other economic opportunities generated from the expenditure of section 3 covered assistance with a recipient or contractor, or by a representative who is not a section 3 resident but who represents one or more section 3 residents;

(2) Any section 3 business concern on behalf of itself, or as a representative of other section 3 business concerns similarly situated, seeking contract opportunities generated from the expenditure of section 3 covered assistance from a recipient or contractor, or by an individual representative of section 3 business concerns.

(b) *Where to file a complaint.* A complaint must be filed with the Assistant Secretary for Fair Housing and Equal Opportunity, Department of Housing and Urban Development, Washington, DC, 20410.

(c) *Time of filing.* (1) A complaint must be received not later than 180 days from the date of the action or

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omission upon which the complaint is based, unless the time for filing is extended by the Assistant Secretary for good cause shown.

(2) Where a complaint alleges noncompliance with section 3 and the regulations of this part that is continuing, as manifested in a number of incidents of noncompliance, the complaint will be timely if filed within 180 days of the last alleged occurrence of noncompliance.

(3) Where a complaint contains incomplete information, the Assistant Secretary shall request the needed information from the complainant. In the event this information is not furnished to the Assistant Secretary within sixty (60) days of the date of the request, the complaint may be closed.

(d) *Contents of complaint—(1) Written complaints.* Each complaint must be in writing, signed by the complainant, and include:

(i) The complainant's name and address;

(ii) The name and address of the respondent;

(iii) A description of the acts or omissions by the respondent that is sufficient to inform the Assistant Secretary of the nature and date of the alleged noncompliance.

(iv) A complainant may provide information to be contained in a complaint by telephone to HUD or any HUD Field Office, and HUD will reduce the information provided by telephone to writing on the prescribed complaint form and send the form to the complainant for signature.

(2) *Amendment of complaint.* Complaints may be reasonably and fairly amended at any time. Such amendments may include, but are not limited to, amendments to cure, technical defects or omissions, including failure to sign or affirm a complaint, to clarify or amplify the allegations in a complaint, or to join additional or substitute respondents. Except for the purposes of notifying respondents, amended complaints will be considered as having been made as of the original filing date.

(e) *Resolution of complaint by recipient.*

(1) Within ten (10) days of timely filing of a complaint that contains complete

information (in accordance with paragraphs (c) and (d) of this section), the Assistant Secretary shall determine whether the complainant alleges an action or omission by a recipient or the recipient's contractor that if proven qualifies as noncompliance with section 3. If a determination is made that there is an allegation of noncompliance with section 3, the complaint shall be sent to the recipient for resolution.

(2) If the recipient believes that the complaint lacks merit, the recipient must notify the Assistant Secretary in writing of this recommendation with supporting reasons, within 30 days of the date of receipt of the complaint. The determination that a complaint lacks merit is reserved to the Assistant Secretary.

(3) If the recipient determines that there is merit to the complaint, the recipient will have sixty (60) days from the date of receipt of the complaint to resolve the matter with the complainant. At the expiration of the 60-day period, the recipient must notify the Assistant Secretary in writing whether a resolution of the complaint has been reached. If resolution has been reached, the notification must be signed by both the recipient and the complainant, and must summarize the terms of the resolution reached between the two parties.

(4) Any request for an extension of the 60-day period by the recipient must be submitted in writing to the Assistant Secretary, and must include a statement explaining the need for the extension.

(5) If the recipient is unable to resolve the complaint within the 60-day period (or more if extended by the Assistant Secretary), the complaint shall be referred to the Assistant Secretary for handling.

(f) *Informal resolution of complaint by Assistant Secretary*—(1) *Dismissal of complaint*. Upon receipt of the recipient's written recommendation that there is no merit to the complaint, or upon failure of the recipient and complainant to reach resolution, the Assistant Secretary shall review the complaint to determine whether it presents a valid allegation of noncompliance with section 3. The Assistant Secretary may conduct further investigation if deemed necessary. Where the com-

plaint fails to present a valid allegation of noncompliance with section 3, the Assistant Secretary will dismiss the complaint without further action. The Assistant Secretary shall notify the complainant of the dismissal of the complaint and the reasons for the dismissal.

(2) *Informal resolution*. Where the allegations in a complaint on their face, or as amplified by the statements of the complainant, present a valid allegation of noncompliance with section 3, the Assistant Secretary will attempt, through informal methods, to obtain a voluntary and just resolution of the complaint. Where attempts to resolve the complaint informally fail, the Assistant Secretary will impose a resolution on the recipient and complainant. Any resolution imposed by the Assistant Secretary will be in accordance with requirements and procedures concerning the imposition of sanctions or resolutions as set forth in the regulations governing the HUD program under which the section 3 covered assistance was provided.

(3) *Effective date of informal resolution*. The imposed resolution will become effective and binding at the expiration of 15 days following notification to recipient and complainant by certified mail of the imposed resolution, unless either party appeals the resolution before the expiration of the 15 days. Any appeal shall be in writing to the Secretary and shall include the basis for the appeal.

(g) *Sanctions*. Sanctions that may be imposed on recipients that fail to comply with the regulations of this part include debarment, suspension and limited denial of participation in HUD programs.

(h) *Investigation of complaint*. The Assistant Secretary reserves the right to investigate a complaint directly when, in the Assistant Secretary's discretion, the investigation would further the purposes of section 3 and this part.

(i) *Intimidatory or retaliatory acts prohibited*. No recipient or other person shall intimidate, threaten, coerce, or discriminate against any person or business because the person or business has made a complaint, testified, assisted or participated in any manner in an investigation, proceeding, or hearing under this part. The identity of

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complainants shall be kept confidential except to the extent necessary to carry out the purposes of this part, including the conduct of any investigation, hearing or judicial proceeding arising thereunder.

(j) *Judicial relief.* Nothing in this subpart D precludes a section 3 resident or section 3 business concerning from exercising the right, which may otherwise be available, to seek redress directly through judicial procedures.

(Approved by the Office of Management and Budget under control number 2529-0043)

### Subpart E—Reporting and Recordkeeping

#### § 135.90 Reporting.

Each recipient which receives directly from HUD financial assistance that is subject to the requirements of this part shall submit to the Assistant Secretary an annual report in such form and with such information as the Assistant Secretary may request, for the purpose of determining the effectiveness of section 3. Where the program providing the section 3 covered assistance requires submission of an annual performance report, the section 3 report will be submitted with that annual performance report. If the program providing the section 3 covered assistance does not require an annual performance report, the section 3 report is to be submitted by January 10 of each year or within 10 days of project completion, whichever is earlier. All reports submitted to HUD in accordance with the requirements of this part will be made available to the public.

(Approved by the Office of Management and Budget under control number 2529-0043)

#### § 135.92 Recordkeeping and access to records.

HUD shall have access to all records, reports, and other documents or items of the recipient that are maintained to demonstrate compliance with the requirements of this part, or that are maintained in accordance with the regulations governing the specific HUD program under which section 3 covered assistance is provided or otherwise

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made available to the recipient or contractor.

### APPENDIX TO PART 135

#### I. Examples of Efforts To Offer Training and Employment Opportunities to Section 3 Residents

(1) Entering into "first source" hiring agreements with organizations representing Section 3 residents.

(2) Sponsoring a HUD-certified "Step-Up" employment and training program for section 3 residents.

(3) Establishing training programs, which are consistent with the requirements of the Department of Labor, for public and Indian housing residents and other section 3 residents in the building trades.

(4) Advertising the training and employment positions by distributing flyers (which identify the positions to be filled, the qualifications required, and where to obtain additional information about the application process) to every occupied dwelling unit in the housing development or developments where category 1 or category 2 persons (as these terms are defined in §135.34) reside.

(5) Advertising the training and employment positions by posting flyers (which identify the positions to be filled, the qualifications required, and where to obtain additional information about the application process) in the common areas or other prominent areas of the housing development or developments. For HAs, post such advertising in the housing development or developments where category 1 or category 2 persons reside; for all other recipients, post such advertising in the housing development or developments and transitional housing in the neighborhood or service area of the section 3 covered project.

(6) Contacting resident councils, resident management corporations, or other resident organizations, where they exist, in the housing development or developments where category 1 or category 2 persons reside, and community organizations in HUD-assisted neighborhoods, to request the assistance of these organizations in notifying residents of the training and employment positions to be filled.

(7) Sponsoring (scheduling, advertising, financing or providing in-kind services) a job informational meeting to be conducted by an HA or contractor representative or representatives at a location in the housing development or developments where category 1 or category 2 persons reside or in the neighborhood or service area of the section 3 covered project.

(8) Arranging assistance in conducting job interviews and completing job applications for residents of the housing development or developments where category 1 or category 2

persons reside and in the neighborhood or service area in which a section 3 project is located.

(9) Arranging for a location in the housing development or developments where category 1 persons reside, or the neighborhood or service area of the project, where job applications may be delivered to and collected by a recipient or contractor representative or representatives.

(10) Conducting job interviews at the housing development or developments where category 1 or category 2 persons reside, or at a location within the neighborhood or service area of the section 3 covered project.

(11) Contacting agencies administering HUD Youthbuild programs, and requesting their assistance in recruiting HUD Youthbuild program participants for the HA's or contractor's training and employment positions.

(12) Consulting with State and local agencies administering training programs funded through JTPA or JOBS, probation and parole agencies, unemployment compensation programs, community organizations and other officials or organizations to assist with recruiting Section 3 residents for the HA's or contractor's training and employment positions.

(13) Advertising the jobs to be filled through the local media, such as community television networks, newspapers of general circulation, and radio advertising.

(14) Employing a job coordinator, or contracting with a business concern that is licensed in the field of job placement (preferably one of the section 3 business concerns identified in part 135), that will undertake, on behalf of the HA, other recipient or contractor, the efforts to match eligible and qualified section 3 residents with the training and employment positions that the HA or contractor intends to fill.

(15) For an HA, employing section 3 residents directly on either a permanent or a temporary basis to perform work generated by section 3 assistance. (This type of employment is referred to as "force account labor" in HUD's Indian housing regulations. See 24 CFR 905.102, and §905.201(a)(6).)

(16) Where there are more qualified section 3 residents than there are positions to be filled, maintaining a file of eligible qualified section 3 residents for future employment positions.

(17) Undertaking job counseling, education and related programs in association with local educational institutions.

(18) Undertaking such continued job training efforts as may be necessary to ensure the continued employment of section 3 residents previously hired for employment opportunities.

(19) After selection of bidders but prior to execution of contracts, incorporating into the contract a negotiated provision for a spe-

cific number of public housing or other section 3 residents to be trained or employed on the section 3 covered assistance.

(20) Coordinating plans and implementation of economic development (e.g., job training and preparation, business development assistance for residents) with the planning for housing and community development.

#### *II. Examples of Efforts To Award Contracts to Section 3 Business Concerns*

(1) Utilizing procurement procedures for section 3 business concerns similar to those provided in 24 CFR part 905 for business concerns owned by Native Americans (see section III of this Appendix).

(2) In determining the responsibility of potential contractors, consider their record of section 3 compliance as evidenced by past actions and their current plans for the pending contract.

(3) Contacting business assistance agencies, minority contractors associations and community organizations to inform them of contracting opportunities and requesting their assistance in identifying section 3 businesses which may solicit bids or proposals for contracts for work in connection with section 3 covered assistance.

(4) Advertising contracting opportunities by posting notices, which provide general information about the work to be contracted and where to obtain additional information, in the common areas or other prominent areas of the housing development or developments owned and managed by the HA.

(5) For HAs, contacting resident councils, resident management corporations, or other resident organizations, where they exist, and requesting their assistance in identifying category 1 and category 2 business concerns.

(6) Providing written notice to all known section 3 business concerns of the contracting opportunities. This notice should be in sufficient time to allow the section 3 business concerns to respond to the bid invitations or request for proposals.

(7) Following up with section 3 business concerns that have expressed interest in the contracting opportunities by contacting them to provide additional information on the contracting opportunities.

(8) Coordinating pre-bid meetings at which section 3 business concerns could be informed of upcoming contracting and subcontracting opportunities.

(9) Carrying out workshops on contracting procedures and specific contract opportunities in a timely manner so that section 3 business concerns can take advantage of upcoming contracting opportunities, with such information being made available in languages other than English where appropriate.

**Pt. 135, App.**

(10) Advising section 3 business concerns as to where they may seek assistance to overcome limitations such as inability to obtain bonding, lines of credit, financing, or insurance.

(11) Arranging solicitations, times for the presentation of bids, quantities, specifications, and delivery schedules in ways to facilitate the participation of section 3 business concerns.

(12) Where appropriate, breaking out contract work items into economically feasible units to facilitate participation by section 3 business concerns.

(13) Contacting agencies administering HUD Youthbuild programs, and notifying these agencies of the contracting opportunities.

(14) Advertising the contracting opportunities through trade association papers and newsletters, and through the local media, such as community television networks, newspapers of general circulation, and radio advertising.

(15) Developing a list of eligible section 3 business concerns.

(16) For HAs, participating in the "Contracting with Resident-Owned Businesses" program provided under 24 CFR part 963.

(17) Establishing or sponsoring programs designed to assist residents of public or Indian housing in the creation and development of resident-owned businesses.

(18) Establishing numerical goals (number of awards and dollar amount of contracts) for award of contracts to section 3 business concerns.

(19) Supporting businesses which provide economic opportunities to low income persons by linking them to the support services available through the Small Business Administration (SBA), the Department of Commerce and comparable agencies at the State and local levels.

(20) Encouraging financial institutions, in carrying out their responsibilities under the Community Reinvestment Act, to provide no or low interest loans for providing working capital and other financial business needs.

(21) Actively supporting joint ventures with section 3 business concerns.

(22) Actively supporting the development or maintenance of business incubators which assist Section 3 business concerns.

*III. Examples of Procurement Procedures That Provide for Preference for Section 3 Business Concerns*

This Section III provides specific procedures that may be followed by recipients and contractors (collectively, referred to as the "contracting party") for implementing the section 3 contracting preference for each of the competitive procurement methods authorized in 24 CFR 85.36(d).

(1) *Small Purchase Procedures.* For section 3 covered contracts aggregating no more than

**24 CFR Subtitle B, Ch. I (4-1-03 Edition)**

\$25,000, the methods set forth in this paragraph (1) or the more formal procedures set forth in paragraphs (2) and (3) of this Section III may be utilized.

(i) *Solicitation.* (A) Quotations may be solicited by telephone, letter or other informal procedure provided that the manner of solicitation provides for participation by a reasonable number of competitive sources. At the time of solicitation, the parties must be informed of:

- the section 3 covered contract to be awarded with sufficient specificity;
- the time within which quotations must be submitted; and
- the information that must be submitted with each quotation.

(B) If the method described in paragraph (i)(A) is utilized, there must be an attempt to obtain quotations from a minimum of three qualified sources in order to promote competition. Fewer than three quotations are acceptable when the contracting party has attempted, but has been unable, to obtain a sufficient number of competitive quotations. In unusual circumstances, the contracting party may accept the sole quotation received in response to a solicitation provided the price is reasonable. In all cases, the contracting party shall document the circumstances when it has been unable to obtain at least three quotations.

(ii) *Award.* (A) Where the section 3 covered contract is to be awarded based upon the lowest price, the contract shall be awarded to the qualified section 3 business concern with the lowest responsive quotation, if it is reasonable and no more than 10 percent higher than the quotation of the lowest responsive quotation from any qualified source. If no responsive quotation by a qualified section 3 business concern is within 10 percent of the lowest responsive quotation from any qualified source, the award shall be made to the source with the lowest quotation.

(B) Where the section 3 covered contract is to be awarded based on factors other than price, a request for quotations shall be issued by developing the particulars of the solicitation, including a rating system for the assignment of points to evaluate the merits of each quotation. The solicitation shall identify all factors to be considered, including price or cost. The rating system shall provide for a range of 15 to 25 percent of the total number of available rating points to be set aside for the provision of preference for section 3 business concerns. The purchase order shall be awarded to the responsible firm whose quotation is the most advantageous, considering price and all other factors specified in the rating system.

(2) *Procurement by sealed bids (Invitations for Bids).* Preference in the award of section 3 covered contracts that are awarded under a sealed bid (IFB) process may be provided as follows:

(i) Bids shall be solicited from all businesses (section 3 business concerns, and non-section 3 business concerns). An award shall be made to the qualified section 3 business concern with the highest priority ranking and with the lowest responsive bid if that bid—

(A) is within the maximum total contract price established in the contracting party's budget for the specific project for which bids are being taken, and

(B) is not more than "X" higher than the total bid price of the lowest responsive bid from any responsible bidder. "X" is determined as follows:

	x=lesser of:
When the lowest responsive bid is less than \$100,000 .....	10% of that bid or \$9,000.
When the lowest responsive bid is:	
At least \$100,000, but less than \$200,000 .....	9% of that bid, or \$16,000.
At least \$200,000, but less than \$300,000 .....	8% of that bid, or \$21,000.
At least \$300,000, but less than \$400,000 .....	7% of that bid, or \$24,000.
At least \$400,000, but less than \$500,000 .....	6% of that bid, or \$25,000.
At least \$500,000, but less than \$1 million .....	5% of that bid, or \$40,000.
At least \$1 million, but less than \$2 million .....	4% of that bid, or \$60,000.
At least \$2 million, but less than \$4 million .....	3% of that bid, or \$80,000.
At least \$4 million, but less than \$7 million .....	2% of that bid, or \$105,000.
\$7 million or more .....	1½% of the lowest responsive bid, with no dollar limit.

(ii) If no responsive bid by a section 3 business concern meets the requirements of paragraph (2)(i) of this section, the contract shall be awarded to a responsible bidder with the lowest responsive bid.

(3) *Procurement under the competitive proposals method of procurement (Request for Proposals (RFP)).* (i) For contracts and sub-contracts awarded under the competitive proposals method of procurement (24 CFR 85.36(d)(3)), a Request for Proposals (RFP) shall identify all evaluation factors (and their relative importance) to be used to rate proposals.

(ii) One of the evaluation factors shall address both the preference for section 3 business concerns and the acceptability of the strategy for meeting the greatest extent feasible requirement (section 3 strategy), as disclosed in proposals submitted by all business concerns (section 3 and non-section 3 business concerns). This factor shall provide for a range of 15 to 25 percent of the total number of available points to be set aside for the evaluation of these two components.

(iii) The component of this evaluation factor designed to address the preference for section 3 business concerns must establish a preference for these business concerns in the order of priority ranking as described in 24 CFR 135.36.

(iv) With respect to the second component (the acceptability of the section 3 strategy), the RFP shall require the disclosure of the contractor's section 3 strategy to comply with the section 3 training and employment preference, or contracting preference, or both, if applicable. A determination of the contractor's responsibility will include the submission of an acceptable section 3 strategy. The contract award shall be made to the responsible firm (either section 3 or non-section 3 business concern) whose proposal is determined most advantageous, considering

price and all other factors specified in the RFP.

**PART 146—NONDISCRIMINATION ON THE BASIS OF AGE IN HUD PROGRAMS OR ACTIVITIES RECEIVING FEDERAL FINANCIAL ASSISTANCE**

**Subpart A—General**

- Sec.
- 146.1 Purpose of the Age Discrimination Act of 1975.
- 146.3 Purpose of HUD's age discrimination regulation.
- 146.5 Applicability of part.
- 146.7 Definitions.

**Subpart B—Standards for Determining Age Discrimination**

- 146.11 Scope of subpart.
- 146.13 Rules against age discrimination.

**Subpart C—Duties of HUD Recipients**

- 146.21 General responsibilities.
- 146.23 Notice of subrecipients.
- 146.25 Assurance of compliance and recipient assessment of age distinctions.
- 146.27 Information requirements.

**Subpart D—Investigation, Settlement, and Enforcement Procedures**

- 146.31 Compliance reviews.
- 146.33 Complaints.
- 146.35 Mediation.
- 146.37 Investigation.
- 146.39 Enforcement procedures.
- 146.41 Prohibition against intimidation or retaliation.

# U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

## Section 3

### Economic Opportunity *A Piece of the American Dream*



U.S. Department of Housing  
and Urban Development

Fair Housing and Equal  
Opportunity

#### HUD Compliance and Monitoring?

HUD monitors the performance of recipients and contractors. HUD examines employment and contract records for evidence of actions taken to train and employ Section 3 residents and to award contracts to Section 3 businesses. HUD provides technical assistance to recipients and contractors in order to obtain compliance with Section 3 requirements.

#### What if it appears that an entity is not complying with Section 3?

There is a complaint process. Section 3 residents and business concerns may file complaints if they think a violation of Section 3 requirements has occurred where a HUD-funded project is planned or underway. Complaints will be investigated; if appropriate, voluntary resolutions will be sought. There are appeal rights to the Secretary. Section 3 residents and businesses may also seek judicial relief.

#### How can Section 3 businesses or residents complain about a violation of Section 3 requirements?

They can file a complaint in writing to the local HUD FHEO Office or to:

**The Assistant Secretary for Fair Housing  
and Equal Opportunity**

U.S. Department of Housing and Urban Development  
451 Seventh Street, SW, Room 5100  
Washington, DC 20410-2000  
1-800-669-9777  
1-800-927-9276 (TTY)

[www.hud.gov](http://www.hud.gov) [www.espanol.hud.gov](http://www.espanol.hud.gov)

A written complaint should contain:

1. Name and address of the person filing the complaint;
2. Name and address of subject of complaint (HUD recipient or contractor);
3. Description of acts or omissions in alleged violation of Section 3;
4. Statement of corrective actions sought.

04736

April 2006  
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Previous Editions are Obsolete



## Section 3 Act

Section 3 of the Housing and Urban Development Act of 1968 (12 U.S.C. 1701u) (as amended), requires that economic opportunities generated by certain HUD financial assistance for housing (including Public and Indian Housing) and community development programs shall, to the greatest extent feasible, be given to low and very low-income persons, particularly those who are recipients of government assistance for housing, and to businesses that provide economic opportunities for these persons.

Other HUD programs covered by Section 3 (to distinguish between HUD Public and Indian housing programs) are those that provide housing or community development assistance for housing rehabilitation, housing construction, or other public construction project.

## Who are Section 3 residents?

Public housing residents including persons with disabilities.

Low and very low income persons who live in the area where a HUD assisted project is located.

## What is a Section 3 business?

A section 3 business is one:

That is owned by Section 3 residents  
Employs Section 3 residents or;  
Subcontracts with businesses that provide opportunities to low and very low income persons.

## What types of Economic Opportunities are available under Section 3?

- ✓ Jobs and Employment opportunities
- ✓ Training and Educational opportunities
- ✓ Contracts and Business opportunities

## Who will provide the Economic Opportunities?

Recipients of HUD financial assistance and their contractors and subcontractors are expected to develop a Section 3 Plan to assure that economic opportunities to the greatest extent feasible, are provided to low and very low-income persons and to qualified Section 3 businesses. One element of that Plan is the use of a Section 3 clause which indicates that all work performed under the contract are subject to the requirements of Section 3.

## Who receives Economic Opportunities under Section 3?

*For training and employment:*

- ✓ persons in public and assisted housing;
- ✓ persons in the affected project neighborhood;
- ✓ participants in HUD Youth-build programs;
- ✓ homeless persons.

*For contracting:*

- ✓ businesses which fit the definition of a Section 3 business.

## How can individuals and businesses find out more about Section 3?

Contact the Fair Housing and Equal Opportunity representative at your nearest HUD Office.

# Section 3

## What is Section 3?

Section 3 is a provision of the Housing and Urban Development (HUD) Act of 1968 that helps foster local economic development, neighborhood economic improvement, and individual self-sufficiency. The Section 3 program requires that recipients of certain HUD financial assistance, to the greatest extent feasible, provide job training, employment, and contracting opportunities for low- or very-low income residents in connection with projects and activities in their neighborhoods.

## How does Section 3 promote self- sufficiency?

Section 3 is a starting point to obtain job training, employment and contracting opportunities. From this integral foundation coupled with other resources comes the opportunity for economic advancement and self-sufficiency.

- Federal, state and local programs
- Advocacy groups
- Community and faith-based organizations

## How does Section 3 promote homeownership?

Section 3 is a starting point to homeownership. Once a Section 3 resident has obtained employment or contracting opportunities they have begun the first step to self-sufficiency.

Remember, "It doesn't have to be fields of dreams". Homeownership is achievable. For more information visit our HUD [website](#).

## Who are Section 3 residents?

Section 3 residents are:

- Public housing residents or
- Persons who live in the area where a HUD-assisted project is located and who have a household income that falls below [HUD's income limits](#).

## Determining Income Levels

- Low income is defined as 80% or below the median income of that area.
- Very low income is defined as 50% or below the median income of that area.

## What is a Section 3 business concern?

A business that:

- Is 51 percent or more owned by Section 3 residents;
- Employs Section 3 residents for at least 30 percent of its full-time, permanent staff; or

- Provides evidence of a commitment to subcontract to Section 3 business concerns, 25 percent or more of the dollar amount of the awarded contract.

**What programs are covered?**

Section 3 applies to HUD-funded Public and Indian Housing assistance for development, operating, and modernization expenditures.

Section 3 also applies to certain HUD-funded Housing and Community Development projects that complete housing rehabilitation, housing construction, and other public construction.

**What types of economic opportunities are available under Section 3?**

- Job training
- Employment
- Contracts

Any employment resulting from these expenditures, including administration, management, clerical support, and construction, is subject to compliance with Section 3.

*Examples of Opportunities include:*

- |                        |                         |                       |
|------------------------|-------------------------|-----------------------|
| • Accounting           | • Electrical            | • Marketing           |
| • Architecture         | • Elevator Construction | • Painting            |
| • Appliance repair     | • Engineering           | • Payroll Photography |
| • Bookkeeping          | • Fencing               | • Plastering          |
| • Bricklaying          | • Florists              | • Plumbing            |
| • Carpentry            | • Heating               | • Printing Purchasing |
| • Carpet Installation  | • Iron Works            | • Research            |
| • Catering             | • Janitorial            | • Surveying           |
| • Cement/Masonry       | • Landscaping           | • Tile setting        |
| • Computer/Information | • Machine Operation     | • Transportation      |
| • Demolition           | • Manufacturing         | • Word processing     |
| • Drywall              |                         |                       |

**Who will award the economic opportunities?**

Recipients of HUD financial assistance will award the economic opportunities. They and their contractors and subcontractors are required to provide, to the greatest extent feasible, economic opportunities consistent with existing Federal, State, and local laws and regulations.

### **Who receives priority under Section 3?**

For training and employment:

- Persons in public and assisted housing
- Persons in the area where the HUD financial assistance is spent
- Participants in HUD Youthbuild programs
- Homeless persons

### **For contracting:**

- Businesses that meet the definition of a Section 3 business concern

### **How can businesses find Section 3 residents to work for them?**

Businesses can recruit Section 3 residents in public housing developments and in the neighborhoods where the HUD assistance is being spent. Effective ways of informing residents about available training and job opportunities are:

- Contacting resident organizations, local community development and employment agencies
- Distributing flyers
- Posting signs
- Placing ads in local newspapers

### **Are recipients, contractors, and subcontractors required to provide long-term employment opportunities, not simply seasonal or temporary employment?**

Recipients are required, to the greatest extent feasible, to provide all types of employment opportunities to low and very low-income persons, including permanent employment and long-term jobs.

Recipients and contractors are encouraged to have Section 3 residents make up at least 30 percent of their permanent, full-time staff.

A Section 3 resident who has been employed for 3 years may no longer be counted towards meeting the 30 percent requirement. This encourages recipients to continue hiring Section 3 residents when employment opportunities are available.

### **What if it appears an entity is not complying with Section 3?**

There is a complaint process. Section 3 residents, businesses, or a representative for either may file a complaint if it seems a recipient is violating Section 3 requirements are being on a HUD-funded project.

### **Will HUD require compliance?**

Yes. HUD monitors the performance of contractors, reviews annual reports from recipients, and investigates complaints. HUD also examines employment and

contract records for evidence that recipients are training and employing Section 3 residents and awarding contracts to Section 3 businesses.

**How can Section 3 residents or Section 3 business concerns allege Section 3 violations?**

You can file a written complaint with your local HUD Field Office.

A written complaint should contain:

- Name and address of the person filing the complaint
- Name and address of subject of complaint (HUD recipient, contractor or subcontractor)
- Description of acts or omissions in alleged violation of Section 3
- Statement of corrective action sought i.e. training, employment or contracts

**CERTIFICATE OF CONSTRUCTION  
COMPLETION**

This is to certify that on the \_\_\_\_\_ day of \_\_\_\_\_, **2013**, a FINAL INSPECTION was made of the project herein described as:

**CONTRACT**

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

OWNER: \_\_\_\_\_

CONSTRUCTION CONTRACTOR: \_\_\_\_\_ of the City of \_\_\_\_\_  
State of Texas.

**PROJECT DESCRIPTION**

CONSTRUCTION OF: \_\_\_\_\_

UCP CONTRACT NO.: \_\_\_\_\_

located in or near the City/Pct. of: \_\_\_\_\_

**THIS IS TO CERTIFY:**

1. That the work has been completed in accordance with the plans and specifications and all addendum(s), change order(s), supplemental agreement(s) thereto, and with the following exceptions: None
2. That the sum of 0.00 zero (\$ 0.00), deducted from the final payment of the Contractor is a fair and equitable settlement for the foregoing except work.
3. That the contractor has presented a "Certificate of Release" stating under oath, that all claims arising out of the performance of work have been fulfilled, and the OWNER is released from all claims arising under or by virtue of said contract.
4. That the CONTRACTOR has presented in behalf of itself and its sureties, satisfactory evidence that it is bound to repair, replace, and make good any faulty workmanship and/or materials discovered in the work within a period of one year from this date, as provided in said contract.

5. Amount of Original Contract:	<u>\$ 0.00</u>
Present Amount of Contract:	<u>\$ 0.00</u>
Total Amount of earned to date:	<u>\$ 0.00</u>
Less: previous payments:	<u>\$ 0.00</u>
Balance:	<u>\$ 0.00</u>
Authorized deductions:	<u>\$ 0.00</u>
AMOUNT OF FINAL PAYMENT:	<u>\$ 0.00</u>

6. That the final payment in the amount of (WORD AMOUNT). (\$0.00) is now due and payable.

\_\_\_\_\_  
**Engineer Signature**

**BY:** \_\_\_\_\_  
(Print Name)

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

**CONCURRED BY:**

\_\_\_\_\_  
*Contractor's Name*

**BY:** \_\_\_\_\_

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

**CONCURRED BY:**

\_\_\_\_\_  
*Urban County Program*

**BY:** \_\_\_\_\_

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

**CONTRACTOR'S FINAL RELEASE  
WAIVER OF LIENS, AND AUTHORIZATION  
TO DISBURSE FUNDS**

THE STATE OF TEXAS {  
  {  
COUNTY OF HIDALGO {

\_\_\_\_\_, doing business as \_\_\_\_\_, hereinafter "Contractor," for good and valuable consideration, the receipt of which is hereby acknowledged, **hereby unconditionally waives and releases: (i) any claim he now has or hereafter may have against Owner (herein defined) and the County of Hidalgo, State of Texas; and (ii) any and all liens and claims or rights of lien which he now has or hereafter may have upon the real property described on Exhibit "A" attached hereto and made a part hereof for all purposes, and on any personal property located on the real property collectively referred to as the "Property;"** on account of labor, materials, supplies, equipment, or otherwise, furnished by Contractor to, or on account of, or for the Property, pursuant to a contract, hereinafter "Contract," dated \_\_\_\_\_, among Contractor, Owner, and the County of Hidalgo, State of Texas. City of \_\_\_\_\_ hereinafter "Owner," is the owner of the Property on which Contractor furnished labor, materials, supplies and/or equipment pursuant to the Contract.

Contractor represents and warrants to Owner and the County of Hidalgo that the parties listed on Exhibit "B" hereto are all of the laborers, subcontractors and suppliers used by Contractor on the Property covered by the Contract. Contractor further represents and warrants to Owner that following Owner's payment of \$ \_\_\_\_\_ through the County of Hidalgo to or on behalf of Contractor, Contractor has been paid the full amount due to Contractor under the Contract, and that Contractor: (i) has likewise paid all its laborers, subcontractors and suppliers who provided labor and materials or supplies or equipment, or any of them, or otherwise, in connection with the Contract; and/or (ii) hereby instructs the County of Hidalgo to pay directly to the parties listed on Exhibit "C" hereto, simultaneously with the execution and delivery of this release, the amount shown by such parties' names, said parties representing all the unpaid laborers, subcontractors and suppliers who provided labor or materials or supplies or equipment, or any of them or otherwise, in connection with the Contract. Contractor hereby authorizes Owner and the County of Hidalgo, as well as any escrow agents, construction agents, or title insurance companies, and their respective successors and assigns, to plead this release and waiver, to the extent it is applicable, in any suit or suits brought by Contractor, its successors, heirs, or assigns, or anyone claiming by, through or under the Contractor, to establish a claim against Owner and/or the County of Hidalgo, and/or to establish a lien upon the Property



(or to charge the same with any lien) for labor or materials or supplies or equipment, or any of them or otherwise, done, performed, furnished or delivered under the Contract.

Contractor understands and acknowledges that Owner and the County of Hidalgo are relying on the agreements, release, waivers and representations stated herein, and such agreements, release, waivers and representations are material inducements for the County of Hidalgo to release the funds it now holds related to the construction of improvements on the Property to the Contractor and/or directly to the laborers, subcontractors and suppliers listed on Exhibit "C" hereto.

Contractor understands and agrees that this release in no way discharges Contractor from his obligations of warranty of material and/or workmanship under the Contract. Without limiting the foregoing, Contractor represents and warrants to Owner that all work performed by him or under his direction on the Property has been completed in accordance with plans and specifications and the terms of the Contract.

The person signing this document represents that he or she is duly authorized to do so on behalf of the Contractor.

All of the provisions of this document shall be binding on the Contractor and his successors and assigns and shall inure to the benefit of Owner and the County of Hidalgo and their respective successors and assigns.

Executed effective as of the \_\_\_\_\_ day of \_\_\_\_\_,

\_\_\_\_\_  
*Signature*

\_\_\_\_\_  
*Name and Title*

THE STATE OF TEXAS {  
  {  
COUNTY OF HIDALGO {

This instrument was acknowledged before me on this the \_\_\_\_\_ day of

\_\_\_\_\_, \_\_\_\_\_, by \_\_\_\_\_, \_\_\_\_\_  
*(title)*

of and on behalf of \_\_\_\_\_  
*(a corporation) (a partnership) (an individual)*

\_\_\_\_\_  
Notary Public, State of Texas

**EXHIBIT "A"**

**EXHIBIT "B"**

**EXHIBIT "C"**

**SUB- CONTRACTOR'S FINAL RELEASE  
WAIVER OF LIENS, AND AUTHORIZATION  
TO DISBURSE FUNDS**

THE STATE OF TEXAS {  
  {  
COUNTY OF HIDALGO {

\_\_\_\_\_,doing business as \_\_\_\_\_, hereinafter " Sub-Contractor," for good and valuable consideration, the receipt of which is hereby acknowledged, **hereby unconditionally waives and releases: (i) any claim he now has or hereafter may have against Owner (herein defined) and the County of Hidalgo, State of Texas; and (ii) any and all liens and claims or rights of lien which he now has or hereafter may have upon the real property described on Exhibit "A" attached hereto and made a part hereof for all purposes, and on any personal property located on the real property collectively referred to as the "Property;"** on account of labor, materials, supplies, equipment, or otherwise, furnished by Sub-Contractor to, or on account of, or for the Property, pursuant to a contract, hereinafter "Contract," dated \_\_\_\_\_, among Contractor, Owner, and the County of Hidalgo, State of Texas. City of \_\_\_\_\_ hereinafter "Owner," is the owner of the Property on which Sub-Contractor furnished labor, materials, supplies and/or equipment pursuant to the Contract.

Sub-Contractor represents and warrants to Owner and the County of Hidalgo that the parties listed on Exhibit "B" hereto are all of the laborers, subcontractors and suppliers used by Contractor on the Property covered by the Contract. Sub- Contractor further represents and warrants to Owner that following Owner's payment of \$ \_\_\_\_\_ through the County of Hidalgo to or on behalf of Sub-Contractor, Sub-Contractor has been paid the full amount due to Sub-Contractor under the Contract, and that Sub-Contractor: (i) has likewise paid all its laborers, subcontractors and suppliers who provided labor and materials or supplies or equipment, or any of them, or otherwise, in connection with the Contract; and/or (ii) hereby instructs the County of Hidalgo to pay directly to the parties listed on Exhibit "C" hereto, simultaneously with the execution and delivery of this release, the amount shown by such parties' names, said parties representing all the unpaid laborers, subcontractors and suppliers who provided labor or materials or supplies or equipment, or any of them or otherwise, in connection with the Contract. Sub-Contractor hereby authorizes Owner and the County of Hidalgo, as well as any escrow agents, construction agents, or title insurance companies, and their respective successors and assigns, to plead this release and waiver, to the extent it is applicable, in any suit or suits brought by Sub-Contractor, its successors, heirs, or assigns, or anyone claiming by, through or under the Sub-Contractor, to establish a claim against



**EXHIBIT "A"**

**EXHIBIT "B"**



October 16, 2012

**RE: ADDENDUM NO.1**  
**Bid No.: 5004/05/12-77-0311-5100-7700-UCP-CJA**  
**Proposal: City of Sullivan City – Street**  
**Improvements (Maro & Valle)**

Dear Gentlemen:

Attached you will find ADDENDUM NO. 1, page 1 of 1 in connection with Hidalgo County-Urban County Program – request for proposal for “street improvements/paving improvements on Maro and Valle Street in Sullivan City”

Please add ADDENDUM NO. 1 to your bid packet to permit your company to submit a complete bid. See original bid packet LEGAL NOTICE page 3 paragraph 9.

**Acknowledge receipt** of ADDENDUM NO. 1 by signing and returning this notice no later than Friday, October 24, 2012 at 10:00 A.M. via fax to (fax No.) or via e-mail (specific e-mail address). If you do not receive all 2 (two) pages of ADDENDUM NO. 1, please notify us immediately at (956) 318-2626.

Please be advised that this ADDENDUM NO. 1 will complete your bid packet for “street improvements/paving improvements on Maro and Valle Street in Sullivan City”

Thank you for your prompt attention to this matter.

**BY:**

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Diana R. Serna, UCP Director

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ADDENDUM NO. 1  
ACKNOWLEDGMENT OF RECEIPT

Enclosures

# ADDENDUM NO. 1

October 24, 2012

**Project No.: 5004/05/12-77-0311-5100-7700-UCP-CJA**

**Proposed Bid Opening Date: October 31, 2012**

**Proposal: "City of Sullivan City – Street Improvements (Maro & Valle)"**

As per questions and answers posed at the Pre-Bid Conference on October 24, 2012, please let this addendum serve as a **FORMAL NOTICE** to all interested parties that requested bid packets for project No. 5004/05/12-77-0311-5100-7700-UCP-CJA that the following changes be made a part of your bid packet.

1. Please note that the following correction to the bid opening date which currently reads as Project No. 5004/05/12-77-0311-5100-7700-UCP-CJA Bid opening scheduled for Wednesday October 31, 2012, has been extended to Wednesday November 14, 2012 and the project identification number will remain the same.
2. Refer to Addendum No. 1 for Exhibit "A" for any changes and concerns that were posed and presented for discussion on October 22, 2012 at the Pre-Bid conference held at the Purchasing Dept., to include new items presented for bidding.
3. Replace Exhibit-B form and use attached with NO Alternates.
4. Walk thru at the Progreso CRC Building is scheduled for Monday, November 05, 2012 at 10:00 AM

All RFP sealed envelopes shall be identified with the correct project No.: 5004/05/12-77-0311-5100-7700-UCP-CJA

I, \_\_\_\_\_, acknowledge receipt of ADDENDUM NO. 1 dated, October 24, 2012, for 5004/05/12-77-0311-5100-7700-UCP-CJA - "City of Sullivan City – Street Improvements (Maro & Valle)"

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Printed Bidder Name

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Date

**NOTE: PLEASE SUBMIT THIS ORIGINAL  
ADDENDUM WITH YOUR PROPOSAL  
PACKET**

**HIDALGO COUNTY URBAN COUNTY PROGRAM  
PARTICIPATING BIDDER'S LOG  
SPECIFICATIONS/BID PACKETS**

**RFB-RFP-RFQ**

**BID OPENING DATE:** \_\_\_\_\_

**BID OPENING TIME:** 9:30 A.M.

**DEPARTMENT/BID DESCRIPTION:** Hidalgo County-Urban County Program "City of Hidalgo – 2016 Parks, Recreational Facility"

**BID No.:** 5016/17-35-0306-5000-3500-UCP-GVG

NAME OF VENDOR: COMPANY/FIRM	BID REQUEST *VIA	SIGNATURE (IF APPLICABLE) OR INITIALS OF STAFF ADDRESSING MAIL OUT	DATE	ADDRESS & PHONE NO
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				

- \*VIA:**  
**IN PERSON (IP)**  
**TELEPHONE REQUEST (TR)**  
**BIDDER LIST MAIL OUT (BLM)**  
**E-MAIL (EM)**  
**FACSIMILE (FAX)**

# HIDALGO COUNTY PURCHASING DEPARTMENT BID TABULATION SHEET

**DEPARTMENT NAME: HIDALGO COUNTY – URBAN COUNTY PROGRAM**

**BID OPENING DATE: October 10, 2018**

**BID OPENING TIME: 9:30 A.M.**

**DESCRIPTION OF BID: “City of Hidalgo – 2016 Parks, Recreational Facility Improvements (Valle Alto Park)**

**BID NO.: 5016/17-35-0306-5000-3500-UCP-GVG**

**PROCUREMENT SPECIALIST:**

**ADDENDUM #1 REQUIRED**

BID # RFB#	NAME OF COMPANY	ADDENDUM	TOTAL PRICE	BID BOND OR CHECK INCLUDED
#1				
#2				
#3				
#4				
#5				
#6				
#7				
#8				

# HIDALGO COUNTY PURCHASING DEPARTMENT BID TABULATION SHEET

**DEPARTMENT NAME: HIDALGO COUNTY – URBAN COUNTY PROGRAM**

**BID OPENING DATE: OCTOBER 10, 2018**

**BID OPENING TIME: 9:30 A.M.**

**DESCRIPTION OF BID: “City of Hidalgo – 2016 Parks, Recreational Facility Improvements (Valle Alto Park)”**

**BID NO: 5016/17-35-0306-5000-3500-UCP-GVG  
ADDENDUM #1 REQUIRED**

**PROCUREMENT SPECIALIST:**

BID # RFB#	NAME OF COMPANY	BASE BID	ALTERNATE #1	ALTERNATE #2	ALTERNATE #3	ADDENDUM REQUIRED	BID BOND OR CHECK INCLUDED
#1							
#2							
#3							
#4							
#5							
#6							
#7							
#8							



**HIDALGO COUNTY  
URBAN COUNTY PROGRAM**

**PROFESSIONAL SERVICES - ENGINEER / ARCHITECT**

REQUEST FOR PAYMENT NO: 3 & FINAL

CITY/PRECINCT: CITY OF YOUR CITY  
 PROJECT NAME: STREET IMPROVEMENTS  
 ENG./ARCH. FIRM: Sample Copy Engineering, Inc.  
 ADDRESS: 1549 Barrel Street  
 CITY/STATE: Your City, Texas ZIP: 78500

Contract Amount: \$ 50,000.00  
 ACCOUNT No.: 5099-00-0311-5000-0000

SCOPE OF SERVICES	ESTIMATED AMOUNT	% COMPLETED TO DATE	TOTAL DUE	LESS PREVIOUS PAYMENTS	AMOUNT DUE THIS REQUEST
Preliminary Phase 15%	7,500	100	7,500	7,500	0
Design Phase 60%	35,000	100	35,000	35,000	0
Construction Phase 25%	12,500	100	12,500	0	12,500
Additional Services					
Reimbursable Expenses*					
<b>TOTAL</b>	<b>\$ 50,000</b>		<b>50,000</b>	<b>42,500</b>	<b>12,500</b>

\*\*Please ATTACH supporting documents to this request\*\*

*I the undersigned certify that the above is true and correct to the best of my knowledge.*

\_\_\_\_\_  
 Engineer/Architect Signature                      Date

\_\_\_\_\_  
 (Print Name)

\_\_\_\_\_  
 City/Precinct/UCP Signature                      Date

\_\_\_\_\_  
 (Print Name)

**HIDALGO COUNTY**  
**URBAN COUNTY PROGRAM**  
**PROJECT - REQUEST FOR PAYMENT**

City/Precinct: \_\_\_\_\_  
 Project Name: \_\_\_\_\_  
 Contractor: \_\_\_\_\_  
 Address: \_\_\_\_\_  
 City/State & Zip: \_\_\_\_\_

Account Number: \_\_\_\_\_  
 Date: \_\_\_\_\_  
 Request for Payment No: \_\_\_\_\_

Original Contract Amount .....	\$	_____
Net Changes by Change Orders .....	\$	_____
Total Contract Amount to Date .....	\$	_____

Estimated % Project Completion to Date: _____ %	
Total Completed to Date .....	\$ _____
Add: Materials on Hand (verified by Engineer) .....	\$ _____
Total Contract Earned .....	\$ _____
Less: Retainage 10% .....	\$ _____
Net Contract Earned .....	\$ _____
Less: Previous Request for Payments .....	\$ _____
Total Amount Due This Request .....	\$ _____

Please accept the **ATTACHED** contractor's invoice as supporting documentation for this request for payment.

*The project (is), (is not) on schedule as per contract time allowed.*

Prepared by (Contractor)	Date	Print Name
--------------------------	------	------------

Approved by (City)	Date	Print Name
--------------------	------	------------

Approved by (Engineer)	Date	Print Name
------------------------	------	------------



**HIDALGO COUNTY  
URBAN COUNTY PROGRAM  
PROFESSIONAL SERVICES –  
CONSTRUCTION MATERIAL TESTING**

REQUEST FOR PAYMENT NO: \_\_\_\_\_

CITY/PRECINCT: \_\_\_\_\_

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

TESTING FIRM: \_\_\_\_\_

ADDRESS: \_\_\_\_\_

CITY/STATE: \_\_\_\_\_ ZIP: \_\_\_\_\_

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

ACCOUNT No.: \_\_\_\_\_

SCOPE OF SERVICES	CONTRACT AMOUNT	LESS PREV. PAYMENTS	TOTAL DUE	AMOUNT DUE THIS REQUEST
Testing Services <b>TOTAL:</b>	\$ _____	_____	_____	_____

**\*\*Please ATTACH testing reports as supporting documents to this request\*\***

*We the undersigned certify that the above is true and correct to the best of my knowledge.*

\_\_\_\_\_  
Testing Firm/Engineer Date

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Approved by City Date

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Approved by Project Engineer Date

\_\_\_\_\_  
Print Name

**HIDALGO COUNTY  
URBAN COUNTY PROGRAM  
UCP CONTRACT CHANGE ORDER REQUEST**

<b>CITY/PCT NAME:</b>	<b>DATE:</b> _____
<b>CONTRACTOR NAME:</b> <b>ADDRESS:</b> <b>CITY:</b> <b>STATE/ZIP:</b>  <b>PHONE NO.:</b>	<b>CHANGE ORDER #.:</b> _____  <b>PROJECT NAME:</b>  <b>PROJECT LOCATION:</b>  _____
	<b>PROJECT NO. :</b> _____

You are hereby requested to comply with the following changes from the contract plans and specifications:


**Final Quantitative Adjustments**  
**Unit Prices**  
**Quantitative Addition**


**Quantitative Deletion**  
**Time Extension**  
**Other**

**REASON:**  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Contract price prior to change order	\$ _____
Net Increase/Decrease of this Change Order	\$ _____
Contract Price with Change Order	\$ _____

Increase/Decrease in time: \_\_\_\_\_ days.  
New Contract Expiration Date: \_\_\_\_\_

**HIDALGO COUNTY  
URBAN COUNTY PROGRAM  
UCP CONTRACT CHANGE ORDER REQUEST**

PROJECT ENGINEER SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_ PRINT NAME \_\_\_\_\_ DATE \_\_\_\_\_

CONTRACTOR'S SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_ PRINT NAME \_\_\_\_\_ DATE \_\_\_\_\_

CITY/PRECINCT'S SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_ PRINT NAME \_\_\_\_\_ DATE \_\_\_\_\_

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**(FOR URBAN COUNTY PROGRAM USE ONLY)**

Scope Increase

Quantitative Addition/Deletion

Scope Decrease

Final Quantitative Adjustment

L/M Beneficiary Change/Impact

Other

Environmental Impact

Approved

Denied

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Title: UCP Director

Signature: \_\_\_\_\_  
Diana R. Serna

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

# NOTICE OF CONTRACT EXPIRATION

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

PROJECT LOCATION: \_\_\_\_\_

PROJECT ACCOUNT NUMBER(S): \_\_\_\_\_

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This is to inform you that \_\_\_\_\_ of \_\_\_\_\_  
Construction Company Address

\_\_\_\_\_, agreed to commence work for the above referenced project on or after  
City/State

the specified "Notice to Proceed" date that was issued to you on \_\_\_\_\_ and to fully  
Date NTP Issued

complete the project within \_\_\_\_\_ consecutive calendar days thereafter. Please let this  
No. of Days

serve as a formal notice that the above referenced contract is set to expire on \_\_\_\_\_  
Contract Expiration Date

and the sum of (\$XXX.XX) XXX hundred dollars and zero cents will be incurred, as liquidated  
Daily Liquidated Damage Amount

damages, for each consecutive calendar day thereafter as provided in the construction contract

and Paragraph 19 of the General Conditions.

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**Antonio Barco, Deputy Director**  
**Urban County Program**  
**1916 Tesoro Blvd.**  
**Pharr, Texas 78577**  
**(956) 787 -8127**

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**Date**