



**LAKE HAVASU CITY**  
**IT ROOM RELOCATION**  
**FA1030**

**CONTRACT DOCUMENTS**  
**AND**  
**TECHNICAL SPECIFICATIONS**

**November, 2016**

**LAKE HAVASU CITY**  
**CONTRACT DOCUMENTS**  
**VOLUME 1**

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SECTION 00020  
**NOTICE INVITING BIDS**  
Lake Havasu City

**PROJECT NO.:** FA1030  
**PROJECT NAME:** IT ROOM RELOCATION  
**BID DUE DATE:** January 5<sup>th</sup>, 2016  
**BID DUE TIME:** 3:00 p.m., ARIZONA TIME

**PROJECT DESCRIPTION:**

This project consists of the demolition and remodeling of an existing room located in the Lake Havasu City Police Station to accommodate a new IT Server Room. The project includes but not limited to new air handlers, a raised floor, fire suppression, new lighting, data and electrical components.

Sealed bids for the project specified will be received by the **City Clerk's Office, 2330 N. McCulloch Boulevard, Lake Havasu City, Arizona, 86403** until the time and date stated. **Bids received by the correct time and date will be opened and read aloud immediately thereafter in Room 109 of Lake Havasu City Hall.**

**Bids must be clearly addressed to the City Clerk's Office, 2330 McCulloch Blvd. N, Lake Havasu City, Arizona, 86403**, and received no later than the exact time and date indicated above. Late bids will not be considered under any circumstances.

Bids must be submitted in a sealed envelope with the Project Number and the bidder's name and address clearly indicated on the envelope. All bids must be completed in ink or typewritten on a form to be obtained from the specifications and a complete Invitation for Bid returned along with the offer no later than the time and date cited above.

Bid documents and specifications are available on Lake Havasu City's website at [www.lhcaz.gov](http://www.lhcaz.gov) or on DemandStar at [www.demandstar.com](http://www.demandstar.com). For documents obtained outside of DemandStar please contact Shannon Blakey, [purchasing@lhcaz.gov](mailto:purchasing@lhcaz.gov) to be added to the planholders' list.

For technical information, contact Jeremy Abbott, P.E., Project Manager, at 928.680.5460.

**BONDS:**

Bid Bond: 10%  
Labor and Material Bond: 100%

Revised 8/26/14

Faithful Performance Bond: 100%

**Project Completion Date:** 90 calendar days after Notice to Proceed.

Lake Havasu City reserves the right to accept or reject any or all bids or any part thereof and waive informalities deemed in the best interest of the City.

*Pursuant to the Americans with Disabilities Act (ADA), Lake Havasu City endeavors to ensure the accessibility of all of its programs, facilities and services to all persons with disabilities. If you need an accommodation for this meeting, please contact the City Clerk's office at (928) 453-4142 at least 24 hours prior to the meeting so that an accommodation may be arranged.*

Publication Dates:

Today's News Herald November 28, 2016 and December 5, 2016.

Arizona Business Gazette December 1, 2016 and December 8, 2016.

\*\* END OF SECTION \*\*

SECTION 00100  
**INFORMATION FOR BIDDERS**

**1. RECEIPT AND OPENING OF BIDS**

The City of Lake Havasu City, Arizona, (hereinafter called the "Owner") invites Bids on the form attached hereto. All blanks must be appropriately filled in. The Bidder shall also complete and submit a form listing proposed subcontractors as enclosed herein. Any subcontractors proposed to be used on the project but not listed on this form shall not be considered when evaluating the Contractor's qualifications and ability to perform the work. Bids for **IT Room Relocations, Project No. FA1030** will be received by the **City Clerk's office, 2330 N. McCulloch Boulevard, Lake Havasu City, Arizona 86403 no later than 3:00 P.M., Arizona Time, Date, Year**, where said Bids will be publicly opened and read aloud immediately thereafter in the Room 109 of Lake Havasu City Hall.

The Owner may consider informal any Bid not prepared and submitted in accordance with the provisions hereof and may waive any informalities or reject any and all Bids. Any Bid may be withdrawn prior to the above scheduled time for the opening of Bids or authorized postponement thereof. Any Bid received after the time and date specified shall not be considered. No Bidder may withdraw a Bid within ninety (90) days after the actual date of the opening thereof.

**2. PREPARATION OF BID**

Each Bid must be submitted on the prescribed Form. Each Document must be submitted with an original signature of the Bidder, as well as all witnesses indicated therein. All blank spaces for Bid prices must be filled in, in ink or typewritten, in both words and figures.

Each Bid must be submitted in a sealed envelope bearing on the outside the name of the Bidder, the Bidder's address, and the name and number of the project for which the Bid is submitted. If forwarded by mail, the sealed envelope containing the Bid must be enclosed in another envelope addressed as specified in the Bid form.

**3. PRE-BID MEETING**

The pre-bid conference will be held for this project at the time and place stipulated in Section 00020 - Notice Inviting Bids, as modified by Addenda.

**4. FACSIMILE BIDS OR MODIFICATIONS**

No facsimile ("FAX") Bids or bid modifications will be accepted. Any modifications to the Bid shall be made by an authorized representative of the bidding company in person.

**5. QUALIFICATIONS OF BIDDER**

The Owner may make such investigations as he deems necessary to determine the qualifications of and the ability of the Bidder to perform the Work, and the Bidder shall

furnish the Owner such information and data for this purpose as the Owner may request. The Owner may request that the Bidder provide a list of key people for the project with their related work experience.

The Owner reserves the right to reject any Bid if the evidence submitted by or investigation of such Bidder fails to satisfy the Owner that such Bidder is properly qualified to carry out the obligations of the Contract and to complete the work contemplated therein in a timely manner. Conditional Bids will not be accepted.

All Bidders and listed subcontractors must be valid Arizona Licensed Contractors at the time of Bidding, approved by the Arizona State Registrar of Contractors to do the type and amount of work specified in these documents. In accordance with the Arizona State Registrar of Contractors, the Bidder must possess a minimum of a Class X Arizona Contractor's License to perform the type and amount of work specified in these documents. **Failure of any bidder to possess all contractors' licenses as listed in the bid packet, at the time of bidding, shall result in the bid being considered non-responsive and not in substantial compliance, and any such bid shall not be considered.** Refer to Section 00420, page 3, item 13.

## **6. ARITHMETIC DISCREPANCIES IN THE BID**

- A. For the purpose of the evaluation of Bids, the following will be utilized in resolving arithmetic discrepancies found on the face of the Bid Schedule as submitted by Bidders:
1. Obviously misplaced decimal points will be corrected;
  2. In case of discrepancy between unit price and extended price, the unit price will govern;
  3. Apparent errors in extension of unit prices will be corrected;
  4. Apparent errors in addition of lump sums and extended prices will be corrected; and
  5. In case of discrepancy between words and figures in unit prices, the amount shown in words shall govern.
- B. For the purpose of Bid evaluation, the Owner will evaluate the bids on the basis of the unit prices, extensions, and totals arrived at by resolution of arithmetic discrepancies as provided above.

## **7. INCOMPLETE BIDS**

Failure to submit a Bid on all items in the Schedule will result in an incomplete Bid and the Bid may be rejected. **UNIT OR LUMP SUM PRICES MUST BE SHOWN FOR EACH BID ITEM WITHIN THE SCHEDULE.**

**NOTE: FAILURE TO INDICATE UNIT OR LUMP SUM PRICES IN THE APPROPRIATE COLUMN, WITH THE EXTENSION OF THE PRICES IN THE FAR RIGHT COLUMN, WILL CAUSE THE BID TO BE "NON-RESPONSIVE".**

**All forms indicated in the Bid Proposal, Section 00300, must be completely filled out, executed, and submitted with the Bid. Failure to do so will render the bid "non-responsive" and the bid will not be accepted.**

**8. BID SECURITY**

Each Bid must be accompanied by certified check, cashier's check, or a Bid Bond prepared on the form attached hereto or on a similar form acceptable to the Owner, duly executed by the Bidder as principal and having as surety thereon a surety company approved by the Owner, in the amount of ten percent (10%) of the Bid. Bid Bonds shall be valid for at least ninety (90) days after the date of the receipt of Bids. Such cash, check or Bid Bond will be returned to all except the three (3) lowest Bidders within fifteen (15) business days after the opening of Bids. The remaining checks, or Bid Bonds will be returned promptly after the Owner and the accepted Bidder have executed the Contract, or if no award has been made within ninety (90) days after the date of the opening of Bids, upon demand of the Bidder at any time thereafter, so long as he has not been notified of the acceptance of his Bid.

**9. LIQUIDATED DAMAGES FOR FAILURE TO ENTER INTO CONTRACT**

The successful Bidder, upon his failure or refusal to execute and deliver the Contract, Bonds, and certificates required within ten (10) calendar days from the date of the Notice of Award, shall forfeit to the Owner, as liquidated damages for such failure or refusal, the difference between his bid and the amount of the contract actually entered into with another party should he not enter into a contract at the bid price and provide the required payment and performance bonds and certificates of insurance. Liquidated damages for failure to enter into the contract shall not exceed the amount of the Bid Bond.

**10. SECURITY FOR FAITHFUL PERFORMANCE AND PAYMENT**

Simultaneously with his delivery of the executed Contract, the Bidder shall furnish **on the forms provided herein**, in 100% of the amount of this Contract, 1) a surety bond as security for faithful performance of this Contract, and 2) a surety bond as security for the payment of all persons performing labor on the project under this Contract and persons furnishing materials in connection with this Contract, and 3) a listing of all subcontractors who will be performing or providing more than one-half percent (0.50%) of the contract work, as specified in the General Conditions included herein. The surety on such bond or bonds shall be a duly authorized surety company satisfactory to the Owner, listed on the Treasury Department's most current list (Circular 570 as amended), and authorized to transact business in the State of Arizona.

**11. POWER OF ATTORNEY**

Attorneys-in-fact who sign Bid Bonds or Contract bonds must file with each bond a certified and effectively dated copy of their power-of-attorney.

**12. LAWS AND REGULATIONS**

The Bidder's attention is directed to the fact that all applicable Federal Laws, State Laws, municipal ordinances, and the rules and regulations of all authorities having jurisdiction over construction of the project shall apply to the Contract throughout, and they will be deemed to be included in the Contract the same as though herein written out in full.

**13. METHOD OF AWARD**

A. The City will award the Contract on the basis of the Bid or Bids most advantageous to the City. In determining whether a Bid is most advantageous, in addition to price, the City may consider the following:

1. The ability, capacity, and skill of the Bidder to perform the Contract or provide the service indicated;
2. Whether the Bidder can perform the Contract or provide the service promptly, and within the time specified without delay or interference;
3. The character, integrity, reputation, judgment, experience, and efficiency of the Bidder;
4. The quality of performance on previous contracts;
5. The previous compliance with laws and ordinances by the Bidder;
6. The financial responsibility of the Bidder to perform under the Contract or provide the service;
7. The limitations of any license the Bidder may be required to possess;
8. The quality, availability, and adaptability of the product or service;
9. The ability of the Bidder to provide future maintenance and/or service;
10. The number and scope of any conditions attached to the Bid; and;
11. The life cycle, maintenance, and performance of the equipment or product being offered.

**14. OBLIGATION OF THE BIDDER**

At the time of the opening of Bids, each Bidder will be presumed to have inspected the site and to have read and to be thoroughly familiar with the Plans and Contract documents (including all Addenda, if applicable). The failure or omission of the Bidder to examine any form, instrument or document, or site changes due to natural causes, shall in no way relieve any Bidder from any obligation in respect to his Bid. Site changes due to natural causes prior to Bid opening shall not be cause for Bid alteration or withdrawal.

**15. TIME OF COMPLETION AND LIQUIDATED DAMAGES**

The Bidder must agree to commence work on or before a date to be specified in a written "Notice to Proceed" from the Owner, and to complete the work within **90 calendar days** of the date of the Notice to Proceed.

The Bidder further agrees to pay as liquidated damages, the sum indicated in the following Schedule of Liquidated Damages for each consecutive calendar day thereafter, plus any additional costs incurred by the Engineer as provided in Section 17 of the General Conditions, that the Contract remains incomplete. For the purposes of determining the Liquidated Damages for the project, the Original Contract Amount shall be that which is included in the Contract between the Owner and the Contractor for the project.

<b>SCHEDULE OF LIQUIDATED DAMAGES</b>		
Original Contract Amount		Daily Charges
From More Than	To and Including	Calendar Day or Fixed Rate
0	25,000	210
25,000	50,000	250
50,000	100,000	280
100,000	500,000	430
500,000	1,000,000	570
1,000,000	2,000,000	710
From More Than	To and Including	Calendar Day or Fixed Rate
2,000,000	5,000,000	1,070
5,000,000	10,000,000	1,420
10,000,000	---0---	1,780

**16. CONDITIONS OF WORK**

Each Bidder must inform himself fully of the conditions relating to the construction of the project and the employment of labor thereon. Failure to do so will not relieve a successful Bidder of his obligation to furnish all material and labor necessary to carry out the provisions of his Contract. Insofar as possible, the Contractor, in carrying out his work, must employ such methods or means as will not cause any interruption of or interference with the work of any other Contractor.

**17. ADDENDA AND INTERPRETATIONS**

All questions that arise relating to this solicitation shall be directed in writing to:

Shannon Blakey  
purchasing@lhcaz.gov  
Community Investment Department  
Lake Havasu City  
2330 McCulloch Blvd. North  
Lake Havasu City, AZ 86403

To be considered, written inquiries shall be received by the above-referenced contact by **(7-9 DAYS before opening) 2016, 4:00PM**, Arizona Time. Inquiries received will then be answered in an Addendum. Any and all such interpretations and any supplemental instructions will be in the form of written Addenda to the Specifications which, if issued, will be available to all prospective Bidders, not later than five (5) calendar days prior to the date fixed for the opening of Bids. Failure of any Bidder to incorporate any such Addendum or interpretation shall not relieve such Bidder from any obligation under his/her Bid as submitted. All Addenda so issued shall become part of the Contract documents.

No informal contact initiated by offerors on this solicitation will be allowed with members of City staff from the date of distribution of this solicitation until after the closing date and time for the submissions of quotations. All questions or issues related to this solicitation shall be submitted in writing.

**18. CONFLICT OF INTEREST**

Pursuant to A.R.S. Section 38-511, this Contract is subject to cancellation by Buyer if any person significantly involved initiating, negotiating, securing, drafting or creating the Contract on behalf of Lake Havasu City is, at any time while the Contract is in effect, an employee of any other party to the Contract in any capacity or a consultant to any other party of the Contract with respect to the subject matter of the Contract.

**19. NO COLLUSION**

The bidder will be required to complete, notarize and submit as part of this bid package the "No Collusion Affidavit" form, as attached herein. Failure of the bidder to submit a properly executed affidavit may be grounds for rejection of the bid.

**20. EMPLOYMENT ELIGIBILITY VERIFICATION**

Lake Havasu City IT Room Relocation

00100-6

The bidder will be required to complete, notarize and submit as part of this bid package the "Employer Verification of Employment Eligibility" form, as attached herein. Failure of the bidder to submit a properly executed verification of eligibility form may be grounds for rejection of the bid.

## **21. EXAMINATION OF THE PLANS AND SPECIFICATIONS**

Each Bid shall be made in accordance with the Plans and Specifications which may be examined at the following locations:

- A. Lake Havasu City, 2330 N. McCulloch Boulevard, Lake Havasu City, AZ 86403, 928.855.2116
- B. Dodge Data & Analytics, 3315 Central Avenue, Hot Springs, AR, 71913, 871.375.2946, FAX 501.625.3544, nancy\_mckeehan@mcgraw-hill.com
- C. Colorado River Building Industry Association, 2182 McCulloch Blvd, Suite 3, Lake Havasu City AZ 86403, 928.453.7755, FAX 928.453.3175
- D. Northern AZ Home Builders, 1500 E. Cedar Avenue, Suite 86, Flagstaff AZ 86004, 928.779.3071, FAX 928.779.4211
- E. Performance Graphics Blueprinting, 4140 Lynn Drive, Suite 107, Fort Mohave, AZ, 86426, 928.763.6860, FAX 928.763.6835
- F. Reed Construction Data, 30 Technology Parkway South, Suite 500, Norcross, GA 30092-2912, 800.876.4045, FAX 800.303.8629
- G. ISqFt, 3301 N 24<sup>th</sup> Street, Phoenix, AZ, 85016, 800.364.2059, FAX 800.792.7508, arizonaplanroom@isqft.com
- H. Integrated Digital Technologies, LLC, 4633 E Broadway Blvd., Tucson, AZ 85711, PO Box 13086, Tucson AZ, 85732, 520.319.0988, FAX, 520.319.1430, [www.contractorsplanroom.com](http://www.contractorsplanroom.com), content@idtplans.com
- I. Yuma/Southwest Contractors Association, 350 W. 16<sup>th</sup> Street, Suite 207, Yuma, AZ 85364, Phone: 928-539-9035, Fax: 928-539-9036
- J. Arizona Builders Exchange, 1700 N. McClintock Drive, Tempe, AZ, 85281, (480) 227-2620, [www.azbex.com](http://www.azbex.com)
- K. Construction Reports.com, 4110 N Scottsdale Road, Suite 335, Scottsdale, AZ, 85251, (480) 994-0020, FAX 480-994-0030
- L. Construction Reporter, 1609 2<sup>nd</sup> Street NW, Albuquerque, NM, 87102, 505-243-9793, FAX 505-242-4758, [www.constructionreporter.com](http://www.constructionreporter.com)

M. PlanRoom Central at A&E Reprographics, 1030 Sandretto Drive, Suite F, Prescott, AZ, 86305, 928.442.9116, [planroom1@a-erepro.com](mailto:planroom1@a-erepro.com)

\*\* END OF SECTION \*\*

SECTION 00300  
**BID PROPOSAL**

Lake Havasu City, Arizona

The undersigned, as bidder, declares that we have received and examined the documents entitled "**IT Room Relocation, Project No. FA1030**" and will contract with the Owner, on the form of Contract provided herewith, to do everything required for the fulfillment of the contract for the construction of the **IT Room Relocation, Project No. FA1030**, at the prices and on the terms and conditions herein contained.

We agree that the Contract Documents include Volumes I and II of the Contract Documents as well as the referenced documents.

**We agree that the following shall form a part of this proposal and are included herein as our submittal:**

<u>Section</u>	<u>Title</u>	<u>Enclosed</u>
<b>00300</b>	<b>Bid Proposal</b>	✓ _____
<b>00310</b>	<b>Bid Schedule</b>	_____
<b>00400</b>	<b>Arizona Statutory Bid Bond</b>	_____
<b>00420</b>	<b>Bidder's Statement of Qualifications</b>	_____
<b>00430</b>	<b>Affidavit of Contractor Certifying That There Was No Collusion In Bidding For Contract</b>	_____
<b>00450</b>	<b>Hazard Communication Program</b>	_____

**We acknowledge that addenda numbers \_\_\_\_\_ through \_\_\_\_\_ have been received and have been examined as part of the Contract Documents.**

We certify that our proposal is genuine, and not sham or collusive, nor made in the interest or behalf of any undisclosed person, organization, or corporation, and that we have not directly or indirectly induced or solicited any other bidder to put in a sham bid, or directly or indirectly induced or solicited any other potential bidder to refrain from bidding, and that we have not in any manner sought by collusion to secure an advantage over any other bidder.

The bidder agrees that this Bid shall be good and may not be withdrawn for a period of ninety (90) calendar days after the scheduled closing time for receiving Bids.

Upon receipt of written notice of the acceptance of this bid, Bidder shall execute the formal Contract attached within 10 days and deliver a Performance Bond, Payment Bond, and Certificates of Insurance as required by Paragraph 25 of the General Conditions and the Special Provisions.

We hereby declare that we have visited the site and have carefully examined the Contract Documents relating to the work covered by the above bid or bids.

Enclosed herewith is a certified or cashier's check or bid bond, payable to Lake Havasu City, Arizona, in the amount of ten percent (10%) of the total bid. This check or bond is submitted as a guarantee that we will enter into a Contract, and furnish the required bonds in the event a contract is awarded us. The bid security attached, without endorsement, is to become the property of Lake Havasu City, Arizona, in the event the Contract and Bonds are not executed within the time set forth, as liquidated damages for delay and additional work caused thereby.

We understand that Lake Havasu City, Arizona reserves the right to reject any and/or all bids, or to waive any informalities in any bid, deemed by them to be for the best interests of Lake Havasu City, Arizona.

Dated in \_\_\_\_\_ this \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_.

Respectfully Submitted By:

By: \_\_\_\_\_

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

Name of Firm: \_\_\_\_\_

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

Phone: \_\_\_\_\_ FAX: \_\_\_\_\_

Seal - If bid by a Corporation:

Arizona Contractor's License No.: \_\_\_\_\_ Type: \_\_\_\_\_

\*\* END OF SECTION \*\*

SECTION 00310

**BID SCHEDULE**  
**LAKE HAVASU CITY**

**IT Room Relocation**  
**(Project No. FA1030)**

Lake Havasu City Council  
Lake Havasu City  
2330 N. McCulloch Boulevard  
Lake Havasu City, AZ 86403

The City Council:

Pursuant to request for bids to be opened the x day of Month, 2016 at 3:00 P.M., Arizona Time, at Room 109 of Lake Havasu City Hall, for the above project, the Contractor proposes to complete work, including furnishing all labor and materials, per the Specifications and Plans at the Following prices.

This Schedule of Items and Prices shall be completed in ink or typed by the Bidding Contractor. In case of discrepancy between the word and figure amount description, the word description shall control extensions.

Prices must be entered for each item and the appropriate subtotal and total blank shall be filled out. Bid prices shall include sales tax and all other applicable taxes and fees.

Bidder agrees to perform all the necessary work to complete the **IT Room Relocation, (Project No. FA1030)**

## SECTION 00310

**IT Room Relocation  
(Project No. FA1030)  
November 5, 2016  
Bid Tabulation**

ITEM #	DESCRIPTION	Quantity	Unit	Unit Price (Word & Price)	Total Amount
	<b>Base Bid</b>				
1	Mobilization, Bonds, and Insurance	1	LS	\$	\$
2	Demolition	1	LS	\$	\$
3	Entry Room Improvements	1	LS	\$	\$
4	Disconnect Switch, 200A, 3-PH	3	EA	\$	\$
5	Disconnect SWITCH , 60 A, 3-PH	2	EA	\$	\$
6	Wireway Gutter 8"X8"X6'	2	EA	\$	\$
7	Cable Tray 24" WIDE 6"DEEP	150	FT	\$	\$
8	Light Fixtures 2 X 4 LED	8	EA	\$	\$
9	IT Racks 24" WIDE, 76" TALL	5	EA	\$	\$
10	Electrical	1	LS	\$	\$
11	Emergency Stop Switch	1	EA	\$	\$
12	Hard Ceiling	420	SQ FT	\$	\$
13	Raised Floor System	420	SQ FT	\$	\$
14	Mechanical	1	LS	\$	\$
15	HVAC Unites - In Room	2	EA	\$	\$
16	Fire Suppression System	1	LS	\$	\$
17	Force Account	1	LS	Ten Thousand Dollars/\$10,000	\$10,000.00
	<b>Base Bid Total</b>				\$

The unit prices for **IT Room Relocation, (Project No FA1030)**, shall include all labor, materials, water disposal, bailing, shoring, removal, disposal, overhead, profit, insurance, and all other related costs and work to cover the finished work of the several kinds called for. Changes in the Contract shall be processed in accordance with Paragraph 16 of the General Conditions.

Bidder understands that the Owner reserves the right to reject any or all Bids, or portions thereof, 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 ninety (90) calendar days after the scheduled closing time for receiving Bids.

Upon receipt of written notice of the acceptance of this Bid, Bidder shall execute the formal Contract attached within 10 days and deliver a Performance Bond, Payment Bond, and Certificates of Insurance as required by Paragraph 25 of the General Conditions and the Special Provisions.

The Bid security attached in the sum of \$ \_\_\_\_\_ is to become the property of the Owner in the event the Contract and Bond(s) are not executed and provided within the time above set forth, as liquidated damages for the delay and additional expense to the Owner caused thereby.

Bidder hereby acknowledges receipt of the following Addenda: \_\_\_\_, \_\_\_\_, \_\_\_\_.

RESPECTFULLY SUBMITTED BY:

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

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

FIRM: \_\_\_\_\_

ADDRESS: \_\_\_\_\_

\_\_\_\_\_

PHONE: \_\_\_\_\_ FAX \_\_\_\_\_

Seal - if Bid by a corporation

AZ Contractor's License No: \_\_\_\_\_ Type \_\_\_\_\_

\*\* END OF SECTION \*\*

SECTION 00400  
**ARIZONA STATUTORY BID BOND**

PURSUANT TO TITLES 28, 34 AND 41, ARIZONA REVISED STATUTES  
(Penalty of this bond must not be less than 10% of the bid amount)

KNOW ALL MEN BY THESE PRESENTS:

That, \_\_\_\_\_(hereinafter "Principal"), as Principal, and \_\_\_\_\_, (hereinafter "Surety"), a corporation organized and existing under the laws of the State of \_\_\_\_\_, with its principal offices in the City of \_\_\_\_\_, holding a certificate of authority to transact surety business in Arizona issued by the Director of the Department of Insurance pursuant to Title 20, Chapter 2, Article 1, as Surety, are held and firmly bound unto Lake Havasu City, Arizona, (hereinafter "Obligee"), as Obligee, in the amount of Ten Percent (10%) of the amount of the bid of Principal, submitted by Principal to the Obligee for the work described below, for the payment of which sum, the Principal and Surety bind themselves, and their heirs, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has submitted a bid for

\_\_\_\_\_, **Project No.** \_\_\_\_\_

NOW, THEREFORE, if the Obligee shall accept the proposal of the Principal and the Principal shall enter into a contract with the Obligee in accordance with the terms of the proposal and give the bonds and certificates of insurance as specified in the standard specifications with good and sufficient surety for the faithful performance of the contract and for the prompt payment of labor and materials furnished in the prosecution of the contract, or in the event of the failure of the Principal to enter into the contract and give the bonds and certificates of insurance, if the Principal pays to the Obligee the difference not to exceed the penalty of the bond between the amount specified in the proposal and such larger amount for which the Obligee may in good faith contract with another party to perform the work covered by the proposal then this obligation is void. Otherwise it remains in full force and effect provided, however, that this bond is executed pursuant to the provisions of Section 34-201, Arizona Revised Statutes, and all liabilities on this bond shall be determined in accordance with the provisions of that section to the extent as if it were copied at length herein.

Witness our hands this \_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_.

---

PRINCIPAL

SEAL

SURETY

SEAL

By: \_\_\_\_\_ By: \_\_\_\_\_  
Attorney-in-Fact

Its: \_\_\_\_\_  
Agency of Record

\_\_\_\_\_  
Agency Address

\*\* END OF SECTION \*\*

SECTION 00420  
BIDDER'S STATEMENT OF QUALIFICATIONS

The Undersigned certifies the truth and correctness of all statements and of all answers to questions made hereinafter.

SUBMITTED TO: Lake Havasu City, Arizona  
2330 N. McCulloch Boulevard  
Lake Havasu City, AZ 86403

SUBMITTED BY: NAME: \_\_\_\_\_  Corporation  Partnership  
ADDRESS: \_\_\_\_\_  Individual  Joint Venture  
PRINCIPAL OFFICE: \_\_\_\_\_  Other

(NOTE: Attach separate sheets as required)

1. How many years has your organization been in business as a Contractor?

2. How many years has your organization been in business under its present business name?

\_\_\_\_\_

3. If a Corporation, answer the following:

Date of Incorporation: \_\_\_\_\_

State of Incorporation: \_\_\_\_\_

President: \_\_\_\_\_

Vice President(s): \_\_\_\_\_

Secretary: \_\_\_\_\_

Treasurer: \_\_\_\_\_

4. If a Partnership, answer the following:

Date of organization: \_\_\_\_\_

Type of Partnership: \_\_\_\_\_

(General/Limited/Assoc.)

Name and Address of all partners.

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

5. If other than a Corporation or Partnership, describe Organization and name Principals:

\_\_\_\_\_

6. What percent of the work do you normally perform with your own forces?

List trades:

\_\_\_\_\_

\_\_\_\_\_

7. Have you ever failed to complete any work awarded to you? If so, indicate when, where and why:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

8. Has any Officer or Partner of your Organization ever been an Officer or Partner of another Organization that failed to complete a construction contract? \_\_\_\_\_ If so, state circumstances:

\_\_\_\_\_

\_\_\_\_\_

9. List major construction projects your Organization has under contract on this date:

Project Name	Name, Email Address & Telephone Number of Owner	Project Location	Contract Amount	Contract Date	Percent Complete	Scheduled Completion

10. List similar construction projects your Organization has completed in the past five years:

Project Name	Name, Email Address & Telephone Number of Owner	Project Location	Contract Amount	Date Awarded	Date Completed	Percent with Own Forces

11. List the construction experience of the principal individuals in your Organization:

Individual's Name	Construction Experience - Years	Within Your Organization		
		Present Position & Years Experience	Dollar Volume Responsibility	Previous Position & Years Experience

12. List states and categories in which your Organization is legally qualified to do business:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

13. List all Arizona Contractor licenses currently held by your Organization; the status of each license; and provide a photocopy of each license with your bid proposal.

	<u>License Class / #</u>	<u>Status</u>
1.	_____	_____
2.	_____	_____
3.	_____	_____
4.	_____	_____

Please attach a list of additional Arizona Contractor licenses, if any.

14. Bank References:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

15. Trade References:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

16. Name of Bonding and Insurance Companies and Name and Address of Agents: Maximum Bonding Capacity \_\_\_\_\_

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

17. The Undersigned agrees to furnish, upon request by the Owner, within seven days after the Bid Opening, a current Statement of Financial Conditions, including Contractor's latest regular dated financial statement or balance sheet which must contain the following items:

Current Assets: (Cash, joint venture accounts, accounts receivable, notes receivable, accrued interest on notes, deposits, and materials and prepaid expenses), net fixed assets and other assets.

Current Liabilities: (Accounts payable, notes payable, accrued interest on notes, provision for income taxes, advances received from owners, accrued salaries, accrued payroll taxes), other liabilities, and capital (capital stock, authorized and outstanding shares par values, earned surplus).

Date of statement or balance sheet: \_\_\_\_\_

Name of firm preparing statement: \_\_\_\_\_

By: \_\_\_\_\_  
(Agent and Capacity)

18. List of Subcontractors. In accordance with paragraph 1.0 of Instructions to Bidders, the following is a breakdown of all subcontractors anticipated to be used for completing this project and their approximate percentage of work to be performed.

The Bidder certifies that all Subcontractors listed are eligible to perform Work on public works projects pursuant to ARS 34-241.

<u>Subcontractor</u>	<u>Description of Work</u>	<u>% of Total Project</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
	Total % of all Subcontractor's work on project	_____

\_\_\_\_\_

Total % for Prime Contractor

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

19. Dated at \_\_\_\_\_ this \_ day of \_\_\_\_\_, \_\_\_\_\_

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

By: \_\_\_\_\_

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

\*\* END OF SECTION \*\*

SECTION 00430  
**AFFIDAVIT OF CONTRACTOR  
CERTIFYING THAT THERE WAS  
NO COLLUSION IN BIDDING  
FOR CONTRACT**

STATE OF            )  
                          ) ss  
CITY OF            )

(NAME OF INDIVIDUAL)

BEING DULY SWORN, DEPOSES AND SAYS:

THAT HE IS \_\_\_\_\_

(TITLE)

OF \_\_\_\_\_

(NAME OF BUSINESS)

THAT PURSUANT TO SECTION 34-253 OF THE ARIZONA REVISED STATUTES, HE CERTIFIES AS FOLLOWS:

THAT NEITHER HE NOR ANYONE ASSOCIATED WITH SAID

\_\_\_\_\_

(NAME OF BUSINESS)

HAS DIRECTLY, OR INDIRECTLY, ENTERED INTO ANY CONTRACT, PARTICIPATED IN ANY COLLUSION OR OTHERWISE TAKEN ANY ACTION IN RESTRAINT OF FREE COMPETITIVE BIDDING IN CONNECTION WITH THIS PROJECT.

\_\_\_\_\_

NAME

\_\_\_\_\_

TITLE

\_\_\_\_\_

NAME OF BUSINESS

SUBSCRIBED AND SWORN TO BEFORE ME THIS \_\_\_ DAY OF \_\_\_\_\_, \_\_\_\_\_

MY COMMISSION EXPIRES: \_\_\_\_\_

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

\*\* END OF SECTION \*\*

SECTION 00450  
HAZARD COMMUNICATION PROGRAM  
Lake Havasu City

**HAZARD COMMUNICATION PROGRAM FOR \_\_\_\_\_**  
*(Name of Company)*

The purpose of this program is to ensure that potential hazards and hazard control measures for chemicals used by this company are understood by company employees.

The written program is available for employee review at any time. It is located \_\_\_\_\_ . A copy of the program will be provided to any employee or employee representative, upon request.

**CONTAINER LABELING:**

\_\_\_\_\_ will verify that all containers received for use by this company will: (name/title of individual)

- \* be clearly labeled as to the contents, matching identification on MSDS;
- \* note the appropriate hazard warnings;
- \* List the name and address of the manufacturer.

No containers will be released for use until the above data is verified.

**MATERIAL SAFETY DATA SHEETS:**

Copies of MSDS's for all hazardous chemicals to which employees may be exposed will be kept

\_\_\_\_\_ will be responsible for ensuring that:  
(name/title of individual)

- \* MSDS's for the new chemicals are available;
- \* MSDS's will be available for review to all employees during each work shift;
- \* Copies will be available on request.

**EMPLOYEE TRAINING AND INFORMATION:**

Each employee will be provided the following information and training before working in areas where hazardous chemicals exist. In addition, if a new hazardous material is introduced into the workplace, affected employees will be given new information and training concerning that material.

**A. Minimum Information Provided:**

- (1) All operations and locations in the work area where hazardous chemicals are present.

## **GENERAL INDUSTRY**

### **A. Minimum Information Provided:**

- (1) The location and availability of the written hazard communication program, including list(s) of hazardous chemicals used and related material safety data sheets;
- (2) The method the company will use to inform employees of potential hazards of non-routine tasks (jobs that are not routine for an individual because of infrequency, location or type.)

### **B. Minimum Training Provided:**

- (1) Methods and observations used to detect the presence or release of a hazardous chemical in the work area (such as company monitoring programs, continuous monitoring device, visual appearance, odor or to other characteristics of hazardous chemicals;
- (2) The physical and health hazards of chemicals in the assigned work area;
- (3) The measures to take to protect against such hazards, including specific company procedures concerning work practices, emergencies and care and use of protective equipment.
- (4) Details of the company hazard communication program, including explanation of the labeling system, the material safety data sheets, and how to obtain and use the appropriate hazard information.

(OPTIONAL) Upon completion of the training, each employee will sign a form acknowledging receipt of the written hazard communication program and related training.

### **HAZARDOUS NON-ROUTINE TASKS:** (If applicable.)

If company employees are required to do hazardous non-routine tasks, such as welding in confined spaces, or cleaning of tanks, the employer must address how the employees doing the work will be informed about the specific hazards to which they will be exposed, what personal protective equipment will be provided and who will be responsible to oversee the operation or operations. If the company does not have any hazardous non-routine tasks, line through this section and state "NO HAZARDOUS NON-ROUTINE TASKS".

### **CHEMICALS IN UNLABELED PIPES:** (If applicable.)

If the company has chemicals in unlabeled pipes, the company must inform the employees of the hazards associated with those chemicals. If the company does not have any chemicals in unlabeled pipes, line through this section and state "NO CHEMICALS IN UNLABELED PIPES".

**INFORMING CONTRACTORS:**

Providing contractors and their employees with the following information is the responsibility of \_\_\_\_\_.

(Name/title of individual)

- (1) Hazardous chemicals to which they may be exposed while on the job site;
- (2) Measures the employees may take to lessen the possibility of exposure;
- (3) Steps the company has taken to lessen the risks;
- (4) Where the MSDS's are for chemicals to which they may be exposed;
- (5) Procedures to follow if they are exposed.

**CONTRACTORS INFORMING EMPLOYERS:**

Contractors entering this workplace with hazardous materials will supply this employer with MSDS's covering those particular products the contractor may expose this company's employees to while working at this site.

LIST OF HAZARDOUS CHEMICALS IN THIS WORKPLACE

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

**CONTRACTOR:**

By: \_\_\_\_\_

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

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

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

END OF SECTION

# SECTION 00460 EMPLOYMENT ELIGIBILITY VERIFICATION FORM

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## INSTRUCTIONS FOR COMPLETION OF EMPLOYMENT ELIGIBILITY VERIFICATION FORM

### WHO MUST COMPLETE THIS FORM:

In accordance with Lake Havasu City Code Chapter 3.30, Employment of Unauthorized Aliens, all contractors and subcontractors furnishing labor, time, or effort for construction or maintenance of any structure, building, transportation facility, or improvements of real property must complete this form.

Contractors or subcontractors, as described above, must certify that they have complied, in good faith, with the applicable requirements of the Federal Immigration Control and Reform Act with respect to the hiring of covered employees. This certification must be executed by an authorized representative.

### WHEN THIS FORM MUST BE COMPLETED:

This form must be completed by all contractors and subcontractors and submitted to the City department awarding the contract, license agreement, or lease no later than notification of successful direct selection, bid, request for proposals, request for qualification, or any similar competitive or noncompetitive procurement or bidding process.

### This form can be found at:

<http://www.lhcaz.gov/docs/default-source/department-documents/employerverificationofemploymenteligibility.pdf>

SECTION 00500  
CONTRACT

THIS CONTRACT is entered into by and between LAKE HAVASU CITY, ARIZONA, a municipal corporation (hereinafter "OWNER"), and \_\_\_\_\_ a(n) STATE corporation, **Federal I.D. # \_\_\_\_\_**, (hereinafter "CONTRACTOR").

WHEREAS, OWNER has developed plans for and desires to commence the Project Name, Project No. (hereinafter "PROJECT"); and

WHEREAS, CONTRACTOR represents that it possesses the experience, competence, equipment and financing to properly complete the PROJECT, and has formally proposed to do so, and to furnish all necessary labor, materials, and equipment and services therefore in accordance with said plans, and subject to the terms and conditions hereof.

NOW, THEREFORE, in consideration of these promises and the mutual covenants herein, it is hereby agreed as follows:

1. CONTRACTOR shall commence and complete the construction of the Project Name, Project No. ;
2. CONTRACTOR shall furnish all of the material, supplies, tools, equipment, labor and other services necessary for the construction and completion of the PROJECT.
3. CONTRACTOR shall commence the PROJECT in accordance with the CONTRACT DOCUMENTS within TEN (10) calendar days after the date of the Notice to Proceed. Final completion of the PROJECT shall occur within XXX calendar days of the date of the Notice to Proceed. The period for completion may be extended through the authorized and approved change order process.
4. Liquidated Damages: OWNER and CONTRACTOR recognize that time is of the essence of this CONTRACT and that OWNER will suffer financial loss if the PROJECT is not completed within the time specified in paragraph 3 above, plus any extensions thereof allowed in accordance with the General Conditions. They also recognize the delays, expense and difficulties involved in proving in a legal or arbitration proceeding the actual losses or damages (including special, indirect, consequential, incidental and any other losses or damages) suffered by OWNER if a complete acceptable PROJECT is not delivered on time.

Accordingly, and instead of requiring proof of such losses or damages, OWNER and CONTRACTOR agree that as liquidated damages for delay (but not as a penalty) CONTRACTOR shall pay the OWNER \$ for each calendar day that expires after the time specified in paragraph 3 for delivery of acceptable Bid Items, plus any costs incurred by the Engineer as provided in Section 17 of the General Conditions.

5. CONTRACTOR agrees to complete the PROJECT in accordance with all of the

terms and conditions of the CONTRACT DOCUMENTS for the sum of \$\_\_\_\_\_ as shown in the Bid Schedule.

6. CONTRACTOR shall submit a completed Section 00450 entitled Hazard Communication Program with the executed copy of this CONTRACT.

7. The term "CONTRACT DOCUMENTS" means and includes the following:

- 00020 Notice Inviting Bids
- 00100 Information for Bidders
- 00300 Bid Proposal
- 00310 Bid Price Schedule
- 00400 Bid Bond
- 00420 Bidder's Statement of Qualifications
- 00430 Bidder's Affidavit of No Collusion
- 00450 Hazard Communication Program
- 00460 Employment Eligibility Verification
- 00500 CONTRACT
- 00500A Indemnification and Insurance Requirements
- 00500B Contractor Claim Handling Procedure
- 00510 Arizona Statutory Performance Bond
- 00520 Arizona Statutory Payment Bond
- 00670 Notice of Award
- 00680 Notice to Proceed
- 00685 Certificate of Substantial Completion
- 00690 Certificate of Final Completion
- 00700 General Conditions
- 00800 Special Provisions
- Technical Specifications and Details
- Construction Contract Drawings
- Change Orders
- Lien Releases (Conditional and Final)
- Addenda

8. OWNER shall pay CONTRACTOR in the manner and at such times as set forth in the General Conditions and in such amounts as required by the CONTRACT DOCUMENTS.

9. In the event CONTRACTOR fails to perform any portion of the PROJECT or satisfy any term or condition of the CONTRACT DOCUMENTS, OWNER may at its sole discretion file notice and/or claim of such failure with CONTRACTOR'S surety.

10. Israel. [CONTRACTOR] certifies that it is not currently engaged in, and agrees for the duration of this [Contract] that it will not engage in, a boycott of Israel, as that term is defined in A.R.S. § 35-393.

11. Export Administration Act. The CONTRACTOR warrants compliance with the Export Administration Act.

12. Recyclable Products. The CONTRACTOR shall use recyclable products and products which contain recycled content to the maximum extent economically feasible in the performance of the work set forth in the CONTRACT.

13. Asbestos License. The CONTRACTOR shall possess an asbestos abatement license if required under A.R.S. Title 32 or 49.

14. Assignment. No right or interest in this CONTRACT shall be assigned by CONTRACTOR without prior, written permission of the OWNER signed by the City Manager; and no delegation of any duty of CONTRACTOR shall be made without prior written permission of the OWNER signed by the City Manager. Any attempted assignment or delegation by CONTRACTOR in violation of this provision shall be a breach of this CONTRACT by CONTRACTOR.

[SIGNATURES ON FOLLOWING PAGE]

SAMPLE

IN WITNESS WHEREOF, the parties hereto have executed, or caused to be executed by their duly authorized officials, this CONTRACT in two (2) copies, each of which shall be deemed an original. The last date of signature shall be the effective date of this CONTRACT.

OWNER:

Lake Havasu City, Arizona

By: \_\_\_\_\_

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

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

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

APPROVED AS TO FORM:

Lake Havasu City Attorney's Office

By: \_\_\_\_\_

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

CITY ENGINEER:

By: \_\_\_\_\_

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

ADMINISTRATIVE SERVICES:

By: \_\_\_\_\_

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

**CONTRACTOR:**

By: \_\_\_\_\_

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

Name/Title: \_\_\_\_\_

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

ATTEST:

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

Name/Title: \_\_\_\_\_

\*\* END OF SECTION \*\*

LAKE HAVASU CITY CONSTRUCTION CONTRACT  
INDEMNIFICATION AND INSURANCE REQUIREMENTS  
(long form)

**I. INDEMNIFICATION**

Contractor shall indemnify and hold harmless City, its officers, employees and volunteers from and against any and all liabilities, damages, losses, and costs, including reasonable attorney's fees, but only to the extent caused by the negligence, recklessness, or intentional wrongful conduct of Contractor or other persons employed or used by the Contractor in the performance of this Contract. It is agreed that Contractor will be responsible for primary loss investigation, defense, and judgment costs where this indemnification is applicable.

**II. INSURANCE REQUIREMENTS**

A. CONTRACTOR and its subcontractors shall procure and maintain until all of their obligations have been discharged, including any warranty periods under this CONTRACT, are satisfied, insurance against claims for injury to persons or damage to property which may arise from or in connection with the performance of the work hereunder by the CONTRACTOR, its agents, representatives, employees or subcontractors.

B. The insurance requirements herein are minimum requirements for this CONTRACT and in no way limit the indemnity covenants contained in this CONTRACT. City in no way warrants that the minimum limits contained herein are sufficient to protect the CONTRACTOR from liabilities that might arise out of the performance of the work under this CONTRACT by the CONTRACTOR, its agents, representatives, employees or subcontractors, and CONTRACTOR is free to purchase additional insurance.

C. MINIMUM SCOPE AND LIMITS OF INSURANCE: CONTRACTOR shall provide coverage with limits of liability not less than those stated below.

**1. Commercial General Liability – Occurrence Form**

Policy shall include bodily injury, property damage, personal injury and broad form contractual liability coverage.

- |   |              |
|---|--------------|
| a. General Aggregate                                | \$10,000,000 |
| b. Products – Completed Operations Aggregate        | \$10,000,000 |
| c. Personal and Advertising Injury                  | \$1,000,000  |
| d. Blanket Contractual Liability – Written and Oral | \$1,000,000  |
| e. Fire Legal Liability                             | \$50,000     |
| f. Each Occurrence                                  | \$5,000,000  |

i. The policy shall be endorsed to include the following additional insured language: *"Lake Havasu City, its*

*departments, agencies, boards, commissions, and its officers, officials, agents, volunteers and employees shall be named as additional insureds with respect to liability arising out of the activities performed by or on behalf of the CONTRACTOR."*

- ii. Policy shall contain a waiver of subrogation against Lake Havasu City, its departments, agencies, boards, commissions, and its officers, officials, agents, volunteers and employees for losses arising from work performed by or on behalf of the CONTRACTOR.
- iii. Completed operations coverage shall remain effective for at least two years following expiration of CONTRACT.

**2. Business Automobile Liability**

a. Bodily Injury and Property Damage for any owned, hired, and/or non-owned vehicles used in the performance of this CONTRACT.

Combined Single Limit (CSL) \$1,000,000

- i. The policy shall be endorsed to include the following additional insured language: "Lake Havasu City, its departments, agencies, boards, commissions, and its officers, officials, agents, volunteers and employees shall be named as additional insureds with respect to liability arising out of the activities performed by or on behalf of the CONTRACTOR, involving automobiles owned, leased, hired or borrowed by the CONTRACTOR."
- ii. Policy shall contain a waiver of subrogation against Lake Havasu City, its departments, agencies, boards, commissions, and its officers, officials, agents, volunteers and employees for losses arising from work performed by or on behalf of the CONTRACTOR.

**3. Workers' Compensation and Employers' Liability**

a. Workers' Compensation	Statutory
b. Employers' Liability Each Accident	\$ 500,000
Disease – Each Employee	\$ 500,000
Disease – Policy Limit	\$1,000,000

- i. Policy shall contain a waiver of subrogation against Lake Havasu City, its departments, agencies, boards, commissions, and its officers, officials, agents,

volunteers and employees for losses arising from work performed by or on behalf of the CONTRACTOR.

- ii. This requirement shall not apply if exempt under A.R.S. Section 23-901.

**4. Professional Liability (Errors and Omissions Liability) (if applicable)**

- a. Each Claim \$1,000,000
- b. Annual Aggregate \$2,000,000

- i. In the event that the professional liability insurance required by this CONTRACT is written on a claims-made basis, CONTRACTOR warrants that any retroactive date under the policy shall precede the effective date of this CONTRACT; and that either continuous coverage will be maintained or an extended discovery period will be exercised for a period of two (2) years beginning at the time work under this CONTRACT is completed.
- ii. The policy shall cover professional misconduct or lack of ordinary skill for those positions defined in the Scope of Work of this CONTRACT.

**5. Builders' Risk (Property) Insurance (Vertical Construction Only)**

a. CONTRACTOR shall purchase and maintain, on a replacement cost basis Builders' Risk insurance in the amount of the initial CONTRACT amount as well as subsequent modifications thereto, including modifications through Change Order, for the entire work at the site. Such Builders' Risk insurance shall be maintained until final payment has been made or until no person or entity other than CITY has an insurable interest in the property required to be covered, whichever is earlier. This insurance shall include interests of CITY, CONTRACTOR and any tier of CONTRACTOR's subcontractors in the work during the life of the CONTRACT and course of construction, and shall continue until the work is completed and accepted by CITY. For new construction projects, CONTRACTOR agrees to assume full responsibility for loss or damage to the work being performed and to the buildings or structures under construction. For renovation construction projects, CONTRACTOR agrees to assume responsibility for loss or damage to the work being performed at least up to the full CONTRACT amount, unless otherwise required by the Contract documents or amendments thereto.

b. Builders' Risk insurance shall be on an all-risk policy form and shall also cover false work and temporary buildings or structures and shall insure against risk of direct physical loss or damage from external

causes including debris removal, demolition occasioned by enforcement of any applicable legal requirements and shall cover reasonable compensation for architects' and engineers' services and expenses, and other "soft costs," required as a result of such insured loss.

c. Builders' Risk insurance must provide coverage from the time any covered property falls within CONTRACTOR's control and/or responsibility and continue without interruption during construction or renovation or installation, including any time during which covered property is being transported to the construction or installation site, and while on the construction or installation site awaiting installation. The policy will provide coverage while the covered premises or any part thereof is occupied. Builders' Risk insurance shall be primary and not contributory.

d. If the CONTRACT requires testing of equipment or materials or other similar operations, at the option of CITY, CONTRACTOR will be responsible for providing property insurance for these exposures under a Boiler Machinery insurance policy.

## **6. Contractor's Personal Property**

CONTRACTOR and each of its subcontractors and suppliers shall be solely responsible for any loss or damage to its or their personal property and that of their employees and workers, including, without limitation, property or materials created or provided pursuant to this CONTRACT, any subcontract or otherwise, its or their tools, equipment, clothing, fencing, forms, mobile construction equipment, scaffolding, automobiles, trucks, trailers or semi-trailers including any machinery or apparatus attached thereto, temporary structures and uninstalled materials, whether owned, used, leased, hired or rented by CONTRACTOR or any subcontractor, consultant or supplier or employee or worker (collectively, "Personal Property"). CONTRACTOR and its subcontractors, consultants and suppliers, at its or their option and own expense, may purchase and maintain insurance for such Personal Property and any deductible or self-insured retention in relation thereto shall be its or their sole responsibility. Any such insurance shall be CONTRACTOR's and the subcontractors', suppliers' volunteers and employees' and workers' sole source of recovery in the event of loss or damage to its or their Personal Property. Any such insurance purchased and maintained by CONTRACTOR and any subcontractor, consultant or supplier shall include a waiver of subrogation as to Owner. CONTRACTOR waives all rights of recovery, whether under subrogation or otherwise, against all such parties for loss or damage covered by CONTRACTOR's property insurance. CONTRACTOR shall require the same waivers from all

subcontractors and suppliers and from the insurers issuing property insurance policies relating to the Work or the Project purchased and maintained by all subcontractors and suppliers. The waivers of subrogation referred to in this subparagraph shall be effective as to any individual or entity even if such individual or entity (a) would otherwise have a duty of indemnification, contractual or otherwise, (b) did not pay the insurance premium, directly or indirectly, and (c) whether or not such individual or entity has an insurable interest in the property which is the subject of the loss or damage.

## **7. Theft, Damage, or Destruction of Work**

In the event of theft, damage or destruction of the Work, CONTRACTOR will re-supply or rebuild its Work without additional compensation and will look to its own resources or insurance coverages to pay for such re-supply or rebuilding. CONTRACTOR will promptly perform, re-supply or rebuild, regardless of the pendency of any claim by CONTRACTOR against any other party, including Owner, that such party is liable for damages, theft or destruction of CONTRACTOR's Work. This subparagraph shall apply except to the extent that the cost of re-supply or rebuilding is paid by Owner's builder's risk insurance; in such event, Owner waives (to the fullest extent permitted by the builder's risk policy) all rights of subrogation against CONTRACTOR and each of its subcontractors to the extent of such payment by Owner's builder's risk insurer.

- D. ADDITIONAL INSURANCE REQUIREMENTS: The policies shall include, or be endorsed to include, the following provisions:
1. Lake Havasu City, its departments, agencies, boards, commissions and its officers, officials, agents, volunteers and employees wherever additional insured status is required. Such additional insured shall be covered to the full limits of liability purchased by the CONTRACTOR, even if those limits of liability are in excess of those required by this CONTRACT.
  2. The Contractor's insurance coverage shall be primary insurance with respect to all other available sources.
  3. Coverage provided by the Contractor shall not be limited to the liability assumed under the indemnification provisions of this CONTRACT.
- E. NOTICE OF CANCELLATION: Each insurance policy required by the insurance provisions of this CONTRACT shall not be suspended, voided, cancelled, reduced in coverage or in limits without ten (10) business days written notice to City. Such notice shall be mailed directly to Lake Havasu

City, Community Investment Department, Procurement Division, 2330 McCulloch Blvd. North, Lake Havasu City, AZ 86403 and shall be sent by certified mail, return receipt requested.

- F. ACCEPTABILITY OF INSURERS: Insurance is to be placed with duly licensed or approved non-admitted insurers in the state of Arizona with an "A.M. Best" rating of not less than A- VII. CITY in no way warrants that the above-required minimum insurer rating is sufficient to protect the CONTRACTOR from potential insurer insolvency.
- G. VERIFICATION OF COVERAGE:
1. CONTRACTOR shall furnish CITY with certificates of insurance as required by this CONTRACT. The certificates for each insurance policy are to be signed by a person authorized by that insurer to bind coverage on its behalf and the Project/contract number and project description shall be noted on the certificate of insurance.
  2. All certificates and endorsements are to be received and approved by CITY at least ten (10) days before work commences. Each insurance policy required by this CONTRACT must be in effect at or prior to commencement of work under this CONTRACT and remain in effect for the duration of the Project. Failure to maintain the insurance policies as required by this CONTRACT, or to provide evidence of renewal, is a material breach of contract.
  3. All renewal certificates required by this CONTRACT shall be sent directly to Lake Havasu City, Community Investment Department, Procurement Division, 2330 McCulloch Blvd. North, Lake Havasu City, AZ 86403. The Project/contract number and project description shall be noted on the certificate of insurance. CITY reserves the right to require complete, certified copies of all insurance policies required by this CONTRACT at any time.
- H. SUBCONTRACTORS: CONTRACTOR's certificate(s) shall include all subcontractors as insureds under its policies **or** CONTRACTOR shall furnish to CITY separate certificates and endorsements for each subcontractor. All coverages for subcontractors shall be subject to the minimum requirements identified above.
- I. APPROVAL: Any modification or variation from the insurance requirements in this CONTRACT must have prior approval from the CITY's Risk Management Division, whose decision shall be final. Such action will not require a formal CONTRACT amendment, but may be made by administrative action.

- J. EXCEPTIONS: In the event the CONTRACTOR or sub-contractor(s) is/are a public entity, then the Insurance Requirements shall not apply. Such public entity shall provide a Certificate of Self-Insurance.

## **CONTRACTOR Claim Handling Procedure**

1. Claimant is to submit in writing to the OWNER or their REPRESENTATIVE the details of the claim to include the where, when, and how of the claim, and an estimate of damage, if applicable.
2. OWNER or their REPRESENTATIVE will forward the claim directly to the CONTRACTOR for handling. The CONTRACTOR is to respond to the claimant, in writing, within 30 calendar days of receipt with copies to:

Lake Havasu City Risk Management  
Lake Havasu City Community Investment Department  
OWNER'S REPRESENTATIVE, if applicable

If the CONTRACTOR denies the claim, the reasons for such denial must be included in the response to the claimant.

SECTION 00510  
ARIZONA STATUTORY PERFORMANCE BOND

PURSUANT TO TITLES 28, 34, AND 41, ARIZONA REVISED STATUTES  
(Penalty of this bond must be 100% of the Contract amount)

KNOW ALL MEN BY THESE PRESENTS THAT: \_\_\_\_\_  
(hereinafter "Principal"), as Principal, and \_\_\_\_\_  
(hereinafter "Surety"), a corporation organized and existing under the laws of the State of \_\_\_\_\_  
with its principal office in the City of \_\_\_\_\_, holding a certificate of authority to  
transact surety business in Arizona issued by the Director of Insurance pursuant to Title 20, Chapter  
2, Article 1, as Surety, are held and firmly bound unto Lake Havasu City, Arizona (hereinafter  
"Obligee") in the amount of \_\_\_\_\_ (Dollars) (\$), for the payment whereof, 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 Obligee, dated  
the \_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_, to furnish all of the material, supplies, tools, equipment, labor and  
other services necessary for the construction and completion of

**IT Room Relocation, Project No. FA1030**

which contract is hereby referred to and made a part hereof as fully and to the same extent as if  
copied at length herein.

NOW, THEREFORE, THE CONDITION OF THE OBLIGATION IS SUCH, that if the Principal  
faithfully performs and fulfills all of the undertakings, covenants, terms, conditions and agreements  
of the contract during the original term of the contract and any extension of the contract, with or  
without notice of the Surety, and during the life of any guarantee required under the contract, and  
also performs and fulfills all of the undertakings, covenants, terms, conditions and agreements of all  
duly authorized modifications of the contract that may hereafter be made, notice of which  
modifications to the Surety being hereby waived, the above obligation is void. Otherwise it remains  
in full force and effect.

PROVIDED, HOWEVER, that this bond is executed pursuant to the provisions of Title 34,  
Chapter 2, Article 2, Arizona Revised Statutes, and all liabilities on this bond shall be determined in  
accordance with the provisions of Title 34, Chapter 2, Article 2, Arizona Revised Statutes, to the  
same extent as if it were copied at length in this agreement.

The prevailing party in a suit on this bond shall recover as part of the judgment reasonable  
attorney fees that may be fixed by a judge of the court.

Witness our hands this \_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_.

\_\_\_\_\_  
PRINCIPAL

\_\_\_\_\_  
SEAL

\_\_\_\_\_  
AGENCY OF RECORD

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

\_\_\_\_\_  
AGENCY ADDRESS

\_\_\_\_\_  
SURETY

\_\_\_\_\_  
SEAL

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

\*\* END OF SECTION \*\*

SECTION 00520  
ARIZONA STATUTORY PAYMENT BOND  
PURSUANT TO TITLES 28, 34, AND 41, ARIZONA REVISED STATUTES  
(Penalty of this bond must be 100% of the Contract amount)

KNOW ALL MEN BY THESE PRESENTS THAT: \_\_\_\_\_  
(hereinafter "Principal"), as Principal, and \_\_\_\_\_ (hereinafter Surety), a corporation organized and existing under the laws of the State of \_\_\_\_\_ with its principal office in the City of \_\_\_\_\_, holding a certificate of authority to transact surety business in Arizona issued by the Director of the Department of Insurance pursuant to Title 20, Chapter 2, Article 1, as Surety, are held and firmly bound unto Lake Havasu City, Arizona (hereinafter "Obligee") in the amount of \_\_\_\_\_ (Dollars) (\$), for the payment whereof, 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 Obligee, dated the \_\_\_\_\_ of \_\_\_\_\_, \_\_\_\_\_, to furnish all of the material, supplies, tools, equipment, labor and other services necessary for the construction and completion of

\_\_\_\_\_

which contract is hereby referred to and made a part hereof as fully and to the same extent as if copied at length herein.

NOW, THEREFOR, THE CONDITION OF THE OBLIGATION IS SUCH, that if the Principal promptly pays all monies due to all persons supplying labor or materials to the Principal or the Principal's subcontractors in the prosecution of the work provided for in the contract, this obligation is void. Otherwise it remains in full force and effect.

PROVIDED, HOWEVER, that this bond is executed pursuant to the provisions of Title 34, Chapter 2, Article 2, Arizona Revised Statutes, and all liabilities on this bond shall be determined in accordance with the provisions, conditions and limitations of Title 34, Chapter 2, Article 2, Arizona Revised Statutes, to the same extent as if it were copied at length in this agreement.

The prevailing party in a suit on this bond shall recover as part of the judgment reasonable attorney fees that may be fixed by a judge of the court.

Witness our hands this \_\_\_ day of \_\_\_\_\_, \_\_\_\_\_.

\_\_\_\_\_  
PRINCIPAL SEAL

\_\_\_\_\_  
BY: \_\_\_\_\_  
AGENCY OF RECORD

\_\_\_\_\_  
AGENCY ADDRESS SURETY SEAL

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

\*\* END OF SECTION

\*\*

SECTION 00670  
NOTICE OF AWARD

TO:

DATE:

**PROJECT DESCRIPTION: IT Room Relocation Project, FA1030**

The OWNER has considered the BID submitted by you for the above described WORK in response to its Advertisement for BIDS dated \_\_\_\_\_, and Information for Bidders.

You are hereby notified that your BID has been accepted for items in the amount of \$\_\_\_\_\_, to include (LIST BID ITEMS AWARDED).

You are required by the Information for Bidders to execute the Contract and furnish the required CONTRACTOR'S Performance Bond, Payment Bond, and Certificates of Liability, Vehicular, and Workmen's Compensation Insurance within ten (10) calendar days from the postmark date when this notice was sent by U.S. Mail.

If you fail to execute said Contract and to furnish said BONDS within ten (10) days from the date of this Notice, said OWNER will be entitled to consider all your rights arising out of the OWNER'S acceptance of your BID as abandoned and as a forfeiture of your BID BOND. The OWNER will be entitled to such other rights as may be granted by law.

You are required to return an acknowledged copy of this NOTICE OF AWARD to the OWNER.

Dated this \_\_\_\_\_ day of \_\_\_\_\_, 2016.

Lake Havasu City, Arizona

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

NAME: Shannon Blakey

TITLE: Contract Specialist

**Acceptance of Notice**

(NOTE: The contractor shall return a signed copy of this notice to the owner.)

Receipt of this NOTICE OF AWARD is hereby acknowledged by:

Contractor

This the \_\_\_\_\_ day of \_\_\_\_\_, 2016.

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

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

\*\* END OF SECTION \*\*

REV 3/30/16

SECTION 00680  
NOTICE TO PROCEED

DATE:

TO:

RE:

You are hereby notified to commence WORK in accordance with the Contract dated \_\_\_\_\_, within ten (10) calendar days of the date of this Notice To Proceed, and you are to complete the WORK within 90 CALENDAR DAYS, with a completion date of \_\_\_\_\_. The period for completion may be extended through the authorized and approved change order process.

OWNER: Lake Havasu City, Arizona

By: \_\_\_\_\_

Name: Shannon Blakey

Title: Contract Specialist

ACCEPTANCE OF NOTICE

(NOTE: The Contractor shall return a signed copy of this Notice to the Owner)

Receipt of the above NOTICE TO PROCEED is hereby acknowledged

this the \_\_\_ day of \_\_\_\_\_, \_\_\_\_\_.

By: \_\_\_\_\_

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

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

\*\* END OF SECTION \*\*

**SECTION 00685  
CERTIFICATE OF SUBSTANTIAL COMPLETION**

I hereby state that the degree of completion of:

**IT Room Relocation Project  
PROJECT NO. FA1030**

Provides the full-time use of the project, or defined portion of the project, for the purposes for which it was intended and is the commencement of the Guarantee Period.

"Substantial Completion" shall not be considered as final acceptance.

**Lake Havasu City, Arizona**

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

By: \_\_\_\_\_

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

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

**ACCEPTANCE OF NOTICE**

(NOTE: The Contractor shall return a signed copy of this Notice to the Owner)

Receipt of the above **CERTIFICATE OF SUBSTANTIAL COMPLETION** is hereby acknowledged this the \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_.

By: \_\_\_\_\_

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

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

**CERTIFICATE OF COMPLETION**

I hereby state that all goods and services required by:

**IT Room Relocation Project  
FA1030**

have been delivered in conformance with the Contract, and all activities required by the Contractor under the Contract were completed as of \_\_\_\_\_.  
(Date)

**Lake Havasu City, Arizona**

By: \_\_\_\_\_

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

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

SECTION 00700  
**GENERAL CONDITIONS**

This section of the Contract Documents is pre-printed. Any modifications to the following Articles, as may be required for this Project, are made in the Special Provisions.

**1.0 DEFINITIONS**

Wherever in the Contract Document the following terms are used, the intent and meaning shall be interpreted as follows:

**1.1 Addenda**

Written or graphic instruments issued prior to the opening of Bids which modify or interpret the Contract Documents, Drawings and Specifications, by additions, deletions, clarifications or corrections.

**1.2 As Approved**

The words "as approved," unless otherwise qualified, shall be understood to be followed by the words "by the Owner."

**1.3 As Shown, and as Indicated**

The words "as shown" and "as indicated" shall be understood to be followed by the words "on the Drawings" or "in the Specifications."

**1.4 Award**

The acceptance, by the Owner, of the successful Bidder's proposal.

**1.5 Bid**

The offer or proposal of the Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.

**1.6 Bidder**

Any individual, firm partnership or corporation, or combination thereof submitting a proposal for the Work contemplated, acting directly or through a duly authorized representative.

**1.7 Bonds**

Bid, Performance, and Payment Bonds and other instruments of security, furnished by the Contractor and its surety in accordance with the Contract Documents.

## **1.8** Calendar Day

Every day shown on the calendar, measured from midnight to the next midnight.

## **1.9** Change Order

A written order to the Contractor, signed by the Owner, covering changes in the Plans, Specifications, or proposal quantities and establishing the basis of payment and contract time adjustment, if any, for the Work affected by such changes.

If the Change Order increases the existing Contract Amount, the Builder's Risk Insurance limit must be increased to the adjusted Contract Amount.

## **1.10** Contract

The "Contract" is the written Contract covering the performance of the Work and the furnishing of labor, materials, incidental services, tools, and equipment in the construction of the Work. It includes Supplemental Contracts amending or extending the Work contemplated in the manner hereinafter described and which may be required to complete the Work in a substantial and acceptable manner to the Owner. The Contract may include Contract Change Orders.

## **1.11** Contract Documents

The "Contract Documents" consist of the Bidding Requirements, Contract Forms, Conditions of the Contract including General and/or Supplemental General Conditions, Special Provisions, the Technical Specifications, and the Drawings, including all Addenda and modifications thereafter incorporated into the Documents before execution and including all other requirements incorporated by specific reference thereto.

## **1.12** Contract Price

The total monies payable by Owner to the Contractor under the terms and conditions of the Contract Documents.

## **1.13** Contract Time

The number of calendar days stated in the Contract Documents for the completion of the Work.

## **1.14** Contractor

The individual, partnership, firm, or corporation primarily liable for the acceptable performance of the Work contracted for and the payment of all legal debts pertaining to the Work who acts directly or through lawful agents or employees to complete the Contract Work.

## **1.15** Days

Unless otherwise specifically stated, the term "days" will be understood to mean calendar days.

### **1.16 Drawings**

The term "Drawings," also described as "Plans," refers to the official drawings, profiles, cross sections, elevations, details, and other working drawings, and supplementary drawings, or reproductions thereof, which show the locations, character, dimensions, and details of the Work to be performed. Drawings may either be bound in the same book as the balance of the Contract Documents or bound in separate sets, and are a part of the Contract Documents, regardless of the method of binding.

### **1.17 Engineer**

The individual, partnership, firm, or corporation duly authorized by the Owner (sponsor) to be responsible for the Engineering of the contract Work and acting directly or through an authorized representative.

### **1.18 Field Order**

A written order effecting a change in the Work not involving an adjustment in the Contract Price or an extension of the Contract Time, issued by the Engineer to the Contractor during construction.

### **1.19 Final Acceptance**

Upon due notice from the Contractor of presumptive completion of the entire project, the Owner will make an inspection. If all construction provided for and contemplated by the contract is found completed to the Owner's satisfaction and all requirements of the contract have been met, that inspection shall constitute the final inspection and the Owner will make the final acceptance and issue the Certificate of Completion.

If, however, the inspection discloses any work, in whole or in part, as being unsatisfactory or that all requirements of the contract have not been met, the Owner will give the Contractor the necessary instructions for correction or completion, and the Contractor shall immediately comply with and execute the instructions. Upon correction of the work, completion of contract requirements, and notification to Owner, another inspection will be made which shall constitute the final inspection provided the work has been satisfactorily completed and all requirements of the contract met. In such event, the Owner will make the final acceptance and issue the Certificate of Completion.

### **1.20 Inspector**

An authorized representative of the Owner assigned to make all necessary inspections and/or tests of the Work performed or being performed, or of the materials furnished or being furnished by the Contractor.

### **1.21 Methodology and Quality of Workmanship**

The manner and sequence of construction which considered to be the acceptable standard in which to perform the Work.

### **1.22 Notice**

The term "notice" or the requirement to notify, as used in the Contract Documents or applicable State or Federal statutes, shall signify a written communication delivered in person or by certified or registered mail to the individual, or to a member of the firm, or to an officer of the corporation for whom it is intended. Certified or registered mail shall be addressed to the last business address known to him who gives the notice.

### **1.23 Notice of Award**

The written notice of the acceptance of the Bid from the Owner to the successful Bidder.

### **1.24 Notice to Proceed**

Written communication issued by the Owner to the Contractor authorizing him to proceed with the Work and establishing the date of commencement of the Work.

### **1.25 Or Equal**

The phrase "or equal" shall be understood to indicate that the "equal" product is the same or better than the product names in function, performance, reliability, quality, and general configuration. Determination of equality in reference to the project design requirements will be made by the Owner.

### **1.26 Owner**

The term "Owner" shall be understood to be Lake Havasu City, Arizona.

### **1.27 Payment Bond**

The approved form of security furnished by the Contractor and its surety as a guaranty that it will pay in full all bills and accounts for materials and labor used in the construction of Work.

### **1.28 Performance Bond**

The approved form of security furnished by the Contractor and its surety as a guarantee that the Contractor will complete the Work in accordance with the terms of the Contract and guarantee the Work for a period of one (1) year after the date of Certificate of Substantial Completion.

### **1.29 Plans**

Plans shall have the same meaning as "Drawings," see Section 1.16.

### **1.30 Project**

The undertaking to be performed as provided in the Contract Documents, see Section 1.11.

### **1.31 Proposal**

The offer of the Bidder for the Work when made out and submitted on the prescribed proposal form, properly signed and guaranteed.

### **1.32 Proposal Guarantee**

The cash, or cashier's check or certified check, or bidder's bond accompanying the Proposal submitted by the Bidder, as a guarantee that the Bidder will enter into a contract with the Owner for the construction or doing of the Work, if it is awarded to it, and will provide the contract bonds and insurance required.

### **1.33 Shop Drawings**

All drawings, diagrams, illustrations, brochures, schedules and other data which are prepared by the Contractor, a Subcontractor, manufacturer, supplier or distributor, which illustrate how specific portions of the Work shall be fabricated or installed.

### **1.34 Specifications**

The directions, provisions and requirements pertaining to the method and manner of performing the Work or to the quantities and qualities of the materials to be furnished under the Contract, together with all other directions, provisions and requirements, plus such amendments, deletions from or additions which may be provided for by Supplemental Contract or Change Orders.

### **1.35 Subcontractor**

A Subcontractor is a person or entity who has a direct or indirect contract with a Contractor to perform any of the Work at the site. For convenience, the term Subcontractor is referred to throughout the Contract Documents as if singular in number and masculine in gender but includes the plural and feminine gender and includes a Sub-Subcontractor or an authorized representative thereof. The term Subcontractor does not include any separate Contractor or its Subcontractors.

### **1.36 Substantial Completion**

"Substantial Completion" shall be that degree of completion of the project or a defined portion of the project, sufficient to provide the Owner, at its discretion, the full-time use of the project or defined portion of the project for the purposes for which it was intended. "Substantial Completion" shall not be considered as final acceptance.

### **1.37 Supplemental General Conditions**

Modifications to General Conditions required by a Federal Agency for participation in the Project and approved by the agency for participation in the Project and approved by the agency in writing prior to inclusion in the Contract Documents and such requirements that may be imposed by applicable state laws. The term also includes modifications or additions to the General Conditions required by the Owner or Engineer.

### **1.38 Supplier**

Any person or organization who supplies materials or equipment for the Work, including that fabricated to a special design, but who does not perform labor at the site.

### **1.39 Surety**

The corporation, partnership, or individual, other than the Contractor, executing Payment, or Performance Bonds which are furnished to the Owner by the Contractor.

### **1.40 Work**

The word "Work" within these Contract Documents shall include all material, labor, tools, utilities, and all appliances, machinery, transportation, and appurtenances necessary to perform and complete the Contract, and such additional items not specifically indicated or described which can be reasonably inferred as belonging to the item described or indicated and as required by good practice to provide a complete and satisfactory system or structure.

### **1.41 Working Day**

A working day shall be any day, other than a legal holiday, Saturday or Sunday, on which the normal working forces of the Contractor may proceed with regular work.

## **2.0 NOTICE TO PROCEED**

**2.1** After the Owner has issued the Notice Of Award, the Contractor shall provide the Performance Bond, the Payment Bond, the Certificate Of Insurance, the Work Schedule, the monthly cash flow, and a signed Contract within ten (10) calendar days. The Owner's attorney will review each document and, if they are found to be acceptable, the Owner will sign and execute the Contract. Within a period of sixty (60) calendar days after executing the Contract,

the Owner will issue the Notice To Proceed. Within ten (10) calendar days of the postmark date of the Notice To Proceed, the Work shall commence. The Contractor shall not commence any Work until such time that the Notice To Proceed has been issued.

### **3.0 ADDITIONAL INSTRUCTIONS AND DETAIL DRAWINGS**

**3.1** The Engineer may furnish additional instructions to the Contractor by means of Drawings or otherwise, during the progress of the Work as necessary to make clear or to define in greater detail the intent of the Specifications and Contract Drawings.

The additional drawings and instruction thus supplied will become a part of the Contract Documents. The Contractor shall carry out the Work in accordance with the additional detail drawings and instructions.

### **4.0 SCHEDULES, REPORTS AND RECORDS**

**4.1** The Contractor shall submit to the Owner payrolls, reports, estimates, records and other data where applicable as are required by the Contract Documents for the Work to be performed.

**4.2** The Contractor, after the Contract award and prior to the Pre-Construction Conference, shall prepare for submittal to the Engineer for review, a detailed progress schedule. The progress schedule shall be brought up to date and submitted to the Engineer prior to each progress payment request, and at such other time intervals as the Engineer may request.

#### **A. Progress Schedule**

The schedule shall be a time-scaled critical path progress schedule showing in detail the proposed sequence of activity. The critical path analysis shall consist of a graphic network diagram and shall clearly show start and completion dates and percentage of work completed.

**4.3** The Contractor shall also forward to the Engineer, prior to each progress payment request, an itemized report of the delivery status of major and critical items of purchased equipment and material, including Shop Drawings and the status of shop and field fabricated work. These progress reports shall indicate the date of the purchase order, the current percentage of completion, estimated delivery, and cause of delay, if any.

**4.4** If the completion of any part of the Work or the delivery of materials is behind the approved schedule, the Contractor shall submit in writing a plan acceptable to the Engineer for bringing the Work up to schedule.

**4.5** The Owner shall have the right to withhold progress payments for the Work if the Contractor fails to update and submit the progress schedule and reports as specified, and such withholding shall not constitute grounds for additional claims by the Contractor against the Owner.

**4.6** The Contractor shall submit an estimated monthly cash flow, based upon the progress schedule with the bonds, schedules, and Certificate Of Insurance.

## **5.0 DRAWINGS AND SPECIFICATONS**

**5.1** The intent of the Drawings and Specifications is that the Contractor shall furnish all labor, materials, tools, equipment, utilities, and transportation necessary for the proper execution of the Work in accordance with the Contract Documents and all incidental work necessary to complete the Project in an acceptable quality and manner, ready for use, occupancy or operation by the Owner.

**5.2** In case of conflict between the Drawings and Specifications, the Specifications shall govern. Figure dimensions on Drawings shall govern over scale dimensions, and detailed Drawings shall govern over general Drawings.

**5.3** Any discrepancies found between the Drawings and Specifications and site conditions or any inconsistencies or ambiguities in the Drawings or Specifications shall be immediately reported verbally and within 24 hours of such a discovery, in writing to the Engineer, who shall promptly correct such inconsistencies or ambiguities in writing. Work done by the Contractor after his discovery of such discrepancies, inconsistencies or ambiguities shall be done at the Contractor's risk, and the Contractor shall assume full responsibility therefor and shall bear all costs attributable thereto, if not acceptable to the Owner.

## **6.0 SHOP DRAWINGS**

**6.1** The Contractor shall provide seven (7) copies of the Shop Drawings as specified or as may be necessary for the prosecution of the Work as required by the Contract Documents. All drawings and schedules shall be submitted sufficiently in advance to allow the Engineer not less than 20 regular working days for checking the submittal. The Engineer's approval of any Shop Drawings shall not release the Contractor from responsibility for deviations from the Contract Documents.

**6.2** When submitted for the Engineer's review, Shop Drawings shall bear the Contractor's certification by means of a signed Stamp, that he has reviewed, checked and approved the Shop Drawings and that they are in conformance with the requirements of the Contract Documents. Shop Drawings, which in the opinion of the Engineer are incomplete or unchecked by the Contractor, will be returned to the Contractor for resubmission in the proper form.

If Shop Drawings or submittals are rejected by the Engineer, all costs incurred by the Engineer Or The Owner for reviewing the resubmittals shall be charged to the Contractor, and the Owner has the right to deduct such costs from any monies owed the Contractor by the Owner.

**6.3** When Shop Drawings have been reviewed by the Engineer, two sets of submittals will be returned to the Contractor appropriately stamped. If major changes or corrections are necessary, the Shop Drawing may be rejected and one set will be returned to the Contractor with such changes or corrections indicated, and the Contractor shall correct and resubmit the

Shop Drawings. No changes shall be made by the Contractor to resubmitted Shop Drawings other than those changes indicated by the Engineer, unless such changes are clearly described in a letter accompanying the resubmitted Shop Drawings.

**6.4** The review of such Shop Drawings and catalog cuts by the Engineer shall not relieve the Contractor from responsibility for corrections of dimensions, fabrication details, and space requirements, or for deviations from the Contract Drawings or Specifications, unless the Contractor has called attention to such deviations in writing by a letter accompanying the Shop Drawings and the Engineer approves the change or deviation in writing at the time of submission; nor shall review by the Engineer relieve the Contractor from the responsibility for errors in the Shop Drawings. When the Contractor does call such deviations to the attention of the Engineer, the Contractor shall state in his letter whether or not such deviations involve any deduction or extra cost adjustment.

**6.5** Portions of the Work requiring a Shop Drawing or sample submission shall not begin until the Shop Drawing or submission has been approved by the Engineer. A copy of each approved Shop Drawing and each approved sample shall be kept in good order by the Contractor at the site and shall be available to the Engineer.

## **7.0 RECORD DRAWINGS**

**7.1** During construction, the Contractor shall keep an accurate record of the following:

- A. Deviations between the Work as shown on the Plans and the Work as actually installed.
- B. The specific locations of piping, valves, electric conduits, duct work, equipment, and other such work which was not located on the Plans. The Record Drawings shall show distances to these locations from known points on the Plans.
- C. Equipment schedules indicating manufacturer's names and model numbers. When all revisions showing work as installed are made, the corrected set of plans shall be delivered to the Engineer before the final pay request is processed. These plans shall be clearly marked "Record Drawings."

**7.2** Nothing contained in this section shall be construed as authorizing any deviation in the Work as shown on the Contract Drawings without a written Change Order or written authority to the Contractor from the Engineer.

## **8.0 MATERIALS, SERVICES, AND FACILITIES**

**8.1** 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, supervision, temporary construction of any nature, and all other services and facilities of any nature whatsoever necessary to execute, complete, and deliver the Work within the specified time.

**8.2** The Contractor shall furnish the Owner a list of materials and the source of supply of each of the materials on the list. The source of supply of each of the materials shall be approved by the Owner before the delivery of said materials is started. Only materials conforming to these Specifications and approved by the Owner shall be used in the Work. All materials proposed for use may be inspected or tested at any time during their preparation and use. After trial, if it is found that sources of supply which have been approved do not furnish a uniform product, or if the product from any source proves unacceptable at any time, the Contractor shall furnish approved material from other approved sources. No material which, after approval, has in any way become unfit for use shall be used in the Work.

**8.3** The Contractor warrants to the Owner and Engineer that the materials and equipment furnished under the Contract will be new and of a quality equal to that specified or approved and, that all Work will be of good quality, free from faults and defects and in conformance with the Contract Documents. Mechanical and electrical equipment shall be the products of manufacturers of established good reputations and regularly engaged in the fabrication of such equipment. Unless otherwise noted, any equipment offered shall be current models which have been in successful regular operation under comparable conditions for a period of at least two years. This time requirement, however, does not apply to minor details nor to thoroughly demonstrated improvements in design or in material of construction. Work shall be done and completed in a thorough and workmanlike manner and if required by Engineer, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment used.

**8.4** All materials which the Engineer or its authorized Inspector has determined do not conform to the requirements of the Plans and Specifications will be rejected. They shall be removed immediately from the vicinity of the Work by the Contractor at his own expense, unless otherwise permitted by the Engineer. No rejected material, the defects of which have been subsequently corrected, shall be used in the Work, unless approval in writing has been given by the Engineer. Upon failure of the Contractor to comply promptly with any order of the Engineer made under the provisions in this section, the Engineer shall have authority to cause the removal and replacement of rejected material and to deduct the cost thereof from any monies due or to become due the Contractor.

**8.5** If any part or portions of the Work done or material furnished under this Contract shall prove defective or non-conforming with the Drawings and Specifications, and if the imperfection in the same shall not be of sufficient magnitude or importance as to make the Work dangerous or unsuitable, or if the removal of such Work will create conditions which are dangerous or undesirable, the Engineer shall have the right and authority to retain such Work but shall make such deductions in the final payment therefor as may be just and reasonable. Such adjustment shall be effected whether or not final payment has been made.

**8.6** Materials and equipment shall be so stored as to insure the preservation of their quality and fitness for the Work. Stored materials and equipment to be incorporated in the Work shall be located so as to facilitate prompt inspection.

**8.7** Manufactured articles, materials and equipment shall be applied, installed, connected,

erected, used, cleaned and conditioned as directed by the manufacturer.

**8.8** Materials, supplies or equipment to be incorporated into the Work shall not be purchased by the Contractor or the Subcontractor subject to a chattel mortgage or under a conditional sale contract or other Contract by which an interest is retained by the seller.

## **9.0 INSPECTION AND TESTING**

**9.1** All material and equipment used in the construction of the Project shall be subject to adequate inspection and testing in accordance with generally accepted standards, as required and defined in the Contract Documents.

**9.2** The Owner shall provide all inspection and testing services not required by the Contract Documents.

**9.3** The Contractor shall provide at its expense the testing and inspection services required by the Contract Documents.

**9.4** If the Contract Documents, laws, ordinances, rules, regulations or orders of any public authority having jurisdiction require any Work to specifically be inspected, tested, or approved by someone other than the Contractor, the Contractor will give the Engineer timely notice of readiness, the minimum of which shall be forty-eight (48) hours. The Contractor will then furnish the Engineer the required certificates of inspection, testing or approval.

**9.5** Inspections, tests or approvals by the Engineer or others shall not relieve the Contractor from its obligations to perform the Work in accordance with the requirements of the Contract Documents.

**9.6** The Engineer and its representatives will at all times have access to the Work. In addition, authorized representatives and agents of any participating Federal or State agency shall be permitted to inspect all Work, materials, payrolls, records of personnel, invoices of materials, and other relevant data and records. The Contractor will provide proper facilities for such access and observation of the Work and also for any inspection, or testing thereof.

**9.7** If any Work is covered contrary to the written instructions of the Engineer or prior to inspection, if must, if requested by the Engineer, be uncovered for his observation and replaced at the Contractor's expense.

**9.8** If the Engineer considers it necessary or advisable that Work that has already been approved be inspected or tested by the Engineer or others, the Contractor, at the Engineer's request, will uncover, expose or otherwise make available for observation, inspection or testing as the Engineer may require, that portion of the Work in question, furnishing all necessary labor, materials, tools, and equipment. If it is found that such Work is defective, the Contractor will bear all the expenses of such uncovering, exposure, observation, inspection and testing and of satisfactory reconstruction. If, however, such Work is not found to be defective, the Contractor will be allowed an increase in the Contract Price or an extension of the Contract

Time, or both, directly attributable to such uncovering, exposure, observation, inspection, testing and reconstruction and an appropriate Change Order shall be issued.

## **10.0 SUBSTITUTIONS**

**10.1** Whenever a material, article or piece of equipment is identified on the Drawings or Specifications by reference to brand name or catalogue number, it shall be understood that this is referenced for the purpose of defining the performance or other salient requirements and that other products of equal capacities, quality and function shall be considered. The Contractor may recommend the substitution of a material, article, or piece of equipment of equal substance and function for those referred to in the Contract Documents by reference to brand name or catalogue number, and if, in the opinion of the Engineer, such material, article, or piece of equipment is of equal substance and function to that specified, the Engineer may approve its substitution and use by the Contractor. Any cost differential shall be deductible from the Contract Price and the Contract Documents shall be appropriately modified by Change Order. The Contractor warrants that if substitutes are approved, no major changes in the function or general design of the Project will result. Incidental changes or extra component parts required to accommodate the substitute will be made by the Contractor without a change in the Contract Price or Contract Time. Any substitutions not properly approved and authorized by the Engineer may be considered defective and the Engineer may require the Contractor to remove the substituted material, article or piece of equipment and the Contractor shall bear any and all costs associated with the removal of the substituted item, including all engineering, inspection, testing or surveying costs incurred by the Owner or the Engineer.

**10.2** Determination of equality in reference to the project design requirements will be made by the Owner. "Equal" products shall not be purchased or installed by the Contractor without the Owner's written approval. Contractor shall have fourteen (14) days after issuance of Notice to Proceed for submission of data substantiating a request for substitution of an "or equal" item.

## **11.0 PATENTS**

**11.1** The Contractor shall pay all applicable royalties and license fees. The Contractor shall defend all suits or claims for infringement of any patent rights and indemnify and hold the Owner and Engineer harmless from loss on account thereof, except that the Owner shall be responsible for any such loss when a particular process, design, or the product of a particular manufacturer or manufacturers is specified, however if the Contractor has reason to believe that the design, process or product specified is an infringement of a patent, it shall be responsible for such loss unless it promptly gives such information to the Engineer.

## **12.0 SURVEYS, PERMITS, REGULATIONS**

**12.1** The Owner shall furnish all boundary surveys and establish all base lines for locating the principal component parts of the Work together with a suitable number of bench marks adjacent to the Work as shown in the Contract Documents. The Contractor shall satisfy itself as to the accuracy of all measurements before constructing any permanent structure and shall not take advantage of any errors which may have been made in laying out the Work. From the

information provided by the Owner, unless otherwise specified in the Contract Documents, the Contractor shall develop and make all detail surveys needed for construction such as slope stakes, batter boards, stakes for pile locations and other working points, lines, elevations and cut sheets.

**12.2** Such stakes and markings as the Engineer may set for either its own or the Contractor's guidance shall be scrupulously preserved by the Contractor. In the event the Contractor, or its employees, destroy or otherwise remove or obliterate such stakes or markings, an amount equal to the cost of replacing the same may be deducted from subsequent estimates due the Contractor at the discretion of the Owner.

**12.3** Permits and licenses of a temporary nature necessary for the prosecution of the Work shall be secured and paid for by the Contractor unless otherwise stated in the Supplemental General Conditions. Permits, licenses and easements for permanent structures or permanent changes in existing facilities shall be secured and paid for by the Owner, unless otherwise specified. The Contractor shall give all notices and comply with all laws, ordinances, rules and regulations bearing on the conduct of the Work as drawn and specified. If the Contractor perceives that the Contract Documents are at variance therewith, he shall promptly notify the Engineer in writing, and any necessary changes shall be adjusted as provided in Section 16. Changes In The Work. If the Contractor performs and works knowing it to be contrary to such laws, ordinances, rules and regulations, and without such notice to the Engineer, he shall assume full responsibility therefore and shall bear all costs attributable thereto.

### **13.0 PROTECTION OF WORK, PROPERTY AND PERSONS**

**13.1** The Contractor shall have sole responsibility for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. The Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to, all employees on the Work and other persons who may be affected thereby, all the Work and all materials or equipment to be incorporated therein, whether in storage on or off the site, and other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities and other items not designated for removal, relocation or replacement in the course of construction.

**13.2** The Contractor shall comply with all applicable laws, ordinances, rules, regulations and orders of any public body having jurisdiction. The Contractor shall erect and maintain, as required by the conditions and progress of the Work, all necessary safeguards for safety and protection. The Contractor shall notify Owners of adjacent utilities when prosecution of the Work may affect them. The Contractor shall remedy all damage, injury or loss to any property caused, directly or indirectly, in whole or in part, by the Contractor, any Subcontractor or anyone directly or indirectly employed by any of them or anyone for whose acts any of them be liable, except damage or loss attributable to the fault of the Contract Documents or to the acts or omissions of the Owner or the Engineer or anyone employed by either of them or anyone for whose acts either of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of the Contractor.

**13.3** In emergencies affecting the safety of persons or the Work or property at the site or adjacent thereto, the Contractor, without special instruction or authorization from the Engineer or Owner, shall act to prevent threatened damage, injury or loss. He shall give the Engineer prompt Written Notice of any significant changes in the Work or deviations from the Contract Documents caused thereby, and a Change Order shall thereupon be negotiated and issued covering the changes and deviations involved, as provided in Section 16.0, Changes in the Work.

**13.4** The Contractor shall designate a responsible member of its organization at the site whose duty shall be the prevention of accidents and the safety of all those at the site. The person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner and the Engineer. The Engineer will not be responsible for safety precautions and programs in connection with the Work or for the Contractor's failure to properly perform its responsibilities with respect to initiating, maintaining and supervising all safety precautions and programs.

#### **14.0 PUBLIC SAFETY**

**14.1** Whenever the Contractor's operations create a condition hazardous to traffic or to the public, it shall furnish at its own expense, and without cost to the Owner, such flagmen and guards as are necessary to give adequate warning to the public of any dangerous conditions to be encountered and he shall furnish, erect, and maintain such fences, barricades, lights, signs, and other devices as are necessary to prevent accidents and avoid damage or injury to the public.

**14.2** Should the Contractor appear to be neglectful or negligent in furnishing warning and protective measures as above provided, the Engineer may direct attention to the existence of a hazard and the necessary warning and protective measures shall be furnished and installed by the Contractor at its own expense without cost to the Owner. Should the Engineer point out the inadequacy of warning and protective measures, such action on the part of the Engineer shall not relieve the Contractor from responsibility for public safety or abrogate his obligation to furnish and pay for these devices.

**14.3** Should the Contractor fail to, be neglectful, or be negligent in furnishing or maintaining warning and protective facilities as required herein, the Owner may furnish or maintain such facilities and charge Contractor therefor by deducting the cost thereof from periodic progress payments due the Contractor as such costs are incurred by Owner.

**14.4** No material or equipment shall be stored where it will interfere with the free and safe passage of public traffic, and at the end of each day's Work and at other times when construction operations are suspended for any reason, the Contractor shall remove all equipment and other obstructions from that portion of the right-of-way open for use by public traffic.

#### **15.0 SUPERVISION BY CONTRACTOR**

**15.1** The Contractor shall supervise and direct the Work, using its best skill and attention. The Contractor shall be solely responsible for the means, methods, techniques, sequences and procedures of construction. The Contractor shall employ and maintain on the Work a qualified supervisor or superintendent who shall have been designated in writing by the Contractor as the Contractor's representative at the site, and who shall have been approved by the Engineer, which approval shall not be unreasonably withheld. The supervisor shall have full authority to act on behalf of the Contractor and all communications given to and by the supervisor shall be as binding as if given to and by the Contractor. The supervisor shall be present on the site at all times. The Contractor shall be responsible to the Owner for the acts and omissions of the employees, subcontractors, and the agents and employees, and other persons performing any other Work under the Contract with the Contractor.

## **16.0 CHANGES IN THE WORK**

**16.1** The Owner may at any time, as the need arises, order changes within the scope of the Work without invalidating the Contract. If such changes increase or decrease the amount due under the Contract Documents, or in the time required for performance of the Work, an equitable adjustment shall be authorized by Change Order.

**16.2** The Engineer, also, may at any time, by issuing a Field Order, make changes in the details of the Work. The Contractor shall proceed with the performance of any changes in the Work so ordered by the Engineer unless the Contractor believes that such Field Order entitles him to a change in Contract Price or Time, or both, in which event he shall give the Engineer Written Notice thereof within seven (7) days after the receipt of the ordered change. Thereafter the Contractor shall document the basis for the change in Contract Price or Time within fourteen (14) days. The Contractor shall not execute such changes pending the receipt of an executed Change Order or further instruction from the Owner.

**16.3** If the Contractor wishes to make a claim for an increase in the Contract sum, it shall give the Engineer written notice thereof within fourteen (14) days after the occurrence of the event giving rise to such claim. This notice shall be given by the Contractor before proceeding to execute the Work, except in an emergency endangering life or property, in which case Contractor shall proceed in accordance with the provisions of the Contract. No such claim shall be valid unless so made. If the Owner and Contractor cannot agree on the amount of adjustment in the Contract sum, it shall be determined by the Engineer. Any change in the Contract sum resulting from such claim shall be authorized in a Change Order.

**16.4** The value of any Work covered by a Change Order shall be determined by one or more of the following methods in the order of precedence listed below:

- A. Unit prices previously approved.
- B. An agreed lump sum.
- C. Cost plus percentage.

## **17.0 TIME FOR COMPLETION AND LIQUIDATED DAMAGES**

**17.1** The date of beginning and the time for completion of the Work are essential conditions of the Contract Documents and the Work embraced shall be commenced on a date specified in the Notice To Proceed.

**17.2** The Contractor shall proceed with the Work at such rate of progress to insure full completion within the Contract Time. It is expressly understood and agreed, by and between the Contractor and the Owner, that the Contract Time for the completion of the Work described herein is a reasonable time, taking into consideration the average climatic and economic conditions and other factors prevailing in the locality of the Work.

**17.3** The Contractor shall only work an eight (8) hour day consisting of Monday through Friday, between 6:00 a.m. to 6:00 p.m., and do not include local municipal holidays. If the Contractor desires to carry on Work more than eight (8) hours each day, or work at night or outside the regular hours, it shall give timely notice (72 hours) to the Engineer and receive the Owner's written approval to allow satisfactory arrangements to be made for inspecting the Work in progress. Should the prosecution of the Work be discontinued for any reason, the Contractor shall notify the Engineer at least 24 hours in advance of resuming operations. The Contractor shall be responsible for any extra compensation due or costs incurred as a result of Contractor's desire to carry out Work beyond an eight (8) hour day, or at night or outside regular hours, including but not limited to, any additional costs or compensation due the Engineer And Owner or its employees or agents as a result of having to be present at the site. The costs or extra compensation necessitated by the Contractor's Work beyond an eight (8) hour day, or at night or outside regular business hours may be deducted or withheld from progress payment or any other payments due to Contractor.

**17.4** If for any reason a suspension of the work should occur; the Contractor, at its own expense, shall do all the Work necessary to provide a safe, smooth and unobstructed passageway through construction for use by public traffic or to provide for the proper and efficient operation of sewer, drainage and other facilities within the site of the Work, during the period of such suspension. In the event that the Contractor fails to perform the Work specified in this Subsection, the Owner will perform such Work and the cost thereof will be deducted from periodic progress payments due the Contractor.

**17.5** During inclement weather and other conditions, the Contractor shall pursue only such portions of the Work as shall not be damaged thereby. No portions of the Work which satisfactory quality or efficiency will be affected by an unfavorable condition shall be constructed while these conditions remain, unless by special means or precautions, approved by the Engineer, the Contractor is able to overcome them.

**17.6** Delays in delivery of equipment or material purchased by the Contractor or its Subcontractor, including Engineer-selected equipment, shall not be considered as a just cause for delay as this is not beyond the control of the Contractor. The Contractor shall be fully responsible for the timely ordering, scheduling, expediting, delivery, and installation of all equipment and materials.

**17.7** In case of failure on the part of the Contractor to complete the Work within the time

affixed in the Contract, or such extension thereof as may be allowed by Engineer or Owner, the Contract shall by that fact be terminated by written notice. The Owner shall not thereafter pay or allow the Contractor any further compensation for any Work done by it under said Contract, and the Contractor and its sureties shall be liable to the Owner for all loss or damage which it may suffer by reason of his failure to complete the Contract within such time. Failure to prosecute the Work diligently shall be grounds for termination by the Owner pursuant to this paragraph.

In the event the Contract should be terminated, the Owner shall have the right to take over the Work and to proceed with the same until it is completed, either by performing said Work itself directly or by contracting it out to some other person or persons, 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 for its completion. Nothing herein contained shall be deemed to limit the right of the Owner in the event of any breach of Contract by the Contractor; but all rights herein given to the Owner are and shall be deemed to be additional to any other rights or remedies which the Owner shall have under any provision of law.

**17.8** Should the Contractor fail to complete the Work, or any part thereof, in the time agreed upon in the Contract or within such extra time as may have been allowed for delays by extensions granted as provided in the Contract, the Contractor shall reimburse the Owner for the additional expense and damage for each calendar day that the Contract remains uncompleted after the Contract completion date. It is agreed that the amount of such additional expense and damage incurred by reason of failure to complete the Work is the per diem rate, as stipulated in Section 15, Information For Bidders, plus any costs incurred by the Engineer including, but not limited to: the Engineer's costs for additional inspection, testing or surveying as a result of the Contractor's failure to complete the Work in the time agreed upon. The said amounts are agreed upon as liquidated damages for the loss to the Owner on account of expense due to the employment of Engineers, inspectors, and other employees after the expiration of the time of completion, and on account of the value of the operation of the Works dependent thereon. It is expressly understood and agreed that this amount is not to be considered in the nature of a penalty, but as liquidated damages which have accrued against the Contractor. The Owner shall have the right to deduct such damages from any amount due, or that may become due the Contractor, or the amount of such damages shall be due and collectible from the Contractor or its Surety.

**17.9** The Contractor shall not be charged with liquidated damages or any excess costs when the delay in completion of the Work is due to any of the reasons set forth below provided the Contractor has given Written Notice of the delay within three (3) days of the occurrence of the cause of the delay to the Owner or Engineer. In the event notice is not given as provided, liquidated damages may be assessed.

A. To unforeseeable causes 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 separate contract with the Owner, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, and abnormal and

unforeseeable weather.

## **18.0 CORRECTION OF WORK**

**18.1** The Contractor shall promptly correct all work rejected by the engineer as defective or as failing to conform to the contract documents, whether observed before or after substantial completion and whether or not fabricated, installed or completed. Contractor shall bear all costs of correcting such rejected work, including compensation for the engineer's additional services made necessary thereby. Contractor shall also bear the costs of making good all work of the Owner or separate Contractor destroyed or damaged by such correction or removal.

**18.2** All removal and replacement work shall be done at the Contractor's expense. If the Contractor does not take action to remove such rejected work within ten (10) days after receipt of Written Notice, the Owner may remove such work and store the materials at the expense of the Contractor, including compensation for the engineer's additional services made necessary thereby.

## **19.0 SUBSURFACE CONDITIONS**

**19.1** The Contractor shall promptly, and before such conditions are disturbed, except in the event of an emergency, notify the Owner by Written Notice of:

- A. Subsurface or latent physical conditions at the site differing materially from those indicated in the Contract Documents; or
- B. Unknown physical conditions at the site, of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in Work of the character provided for in the Contract Documents.

**19.2** The Owner shall promptly investigate the conditions, and if it finds that such conditions do so materially differ and cause an increase or decrease in the cost of, or in the time required for, performance of the Work, an equitable adjustment shall be made and the Contract Documents shall be modified by a Change Order. Any claim of the Contractor for adjustment hereunder shall not be allowed unless he has given the required Written Notice; provided that the Owner may, if he determines the facts so justify, consider and adjust any such claims asserted before the date of final payment.

## **20.0 SUSPENSION OF WORK, TERMINATION AND DELAY**

**20.1** The Owner may suspend the Work or any portion thereof for a period of not more than ninety (90) days or such further time as agreed upon by the Contractor, by Written Notice to the Contractor and the Engineer which notice shall fix the date on which Work shall be resumed. The Contractor shall resume that Work on the date so fixed. The Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Time, or both, directly attributable to any suspension.

**20.2** In addition to any other reasons for termination provided in the Contract, the Contractor shall be considered in default of the Contract and such default will be considered as cause for the Owner to terminate the Contract for any of the following reasons if the Contractor:

- A. Fails to begin the Work under the Contract within the time specified in the "Notice To Proceed," or
- B. Fails to perform the Work or fails to provide sufficient workers, equipment or materials to assure completion of Work in accordance with the terms of the Contract, or
- C. Performs the Work unsuitably or neglects or refuses to remove materials or to perform such new Work as may be rejected as unacceptable and unsuitable, or
- D. Discontinues the prosecution of the Work, or
- E. Fails to resume Work which has been discontinued within a reasonable time after notice to do so, or
- F. Becomes insolvent or is declared bankrupt, or commits any act of bankruptcy or insolvency, or
- G. Allows any final judgment to stand against him unsatisfied for a period of 10 days, or
- H. Makes an assignment for the benefit of creditors, or acceptable manner, or
- I. Is otherwise in breach of the Contract and has failed to remedy the breach within ten (10) days of written notice of the existence of such breach, or
- J. Fails to provide safe conditions for its workers and/or the general public.

Should the Owner consider the Contractor in default of the Contract for any reason above, he shall immediately give Written Notice to the Contractor and the Contractor's surety as to the reasons for considering the Contractor in default and the Owner's intentions to terminate the Contract.

If the Contractor or Surety, within a period of 10 days after Written Notice, does not proceed in accordance therewith, then the Owner shall have, upon written notification of the facts of such delay or neglect, the power and authority without violating the Contract, to take the prosecution of the Work out of the hands of the Contractor. The Owner may appropriate or use any or all materials and equipment that have been mobilized for use in the Work and are acceptable and may enter into an Contract for the completion of said Contract according to the terms and provisions thereof, or use such other methods as in the opinion of the Owner will be required for the completion of said Contract in an acceptable manner.

All costs and charges incurred by the Owner, together with the cost of completing the Work under Contract, will be deducted from any monies due or which may come due the Contractor. If such expense exceeds the sum which would have been payable under the Contract, then the Contractor and the Surety shall pay to the Owner the amount of such excess.

**20.3** Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue. Any retention or payment of monies due Contractor by Owner will not release Contractor from liability.

**20.4** Upon seven days Written Notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, elect to terminate the Contract. In such case, Contractor shall be paid (without duplication of any items):

**20.4.1** for completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such work;

**20.4.2** for expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead on such expenses;

**20.4.3** for reasonable costs incurred in settlement of terminated contracts with Subcontractors, Suppliers and others; and

**20.4.4** for reasonable expenses directly attributable to termination.

Contractor shall not be paid on account of loss of anticipated profits or revenue or other economic loss arising out of or resulting from such termination.

**20.5** If the Work should be stopped under an order of any court or other public authority for a period of more than ninety (90) days, through no act or fault of the Contractor or of anyone employed by him, or if the Owner should fail to pay the Contractor within 45 days after the time specified in the Payments To Contractor, Section 22.0, then the Contractor may, upon 15 days Written Notice to the Owner, stop Work until payment of the amount owing has been received.

**20.6** The Owner may terminate the Contract or a portion thereof if conditions encountered during the progress of the Work make it impossible or impracticable to proceed with the Work or a local or national emergency exists.

When Contracts, or any portion thereof, are terminated before completion of all Work in the Contract, adjustments in the amount bid for the pay items will be made on the actual quantity of Work performed and accepted, or as mutually agreed for pay items of Work partially completed or not started. No claim for loss of anticipated profits will be considered.

Termination of the Contract or any portion thereof shall not relieve the Contractor of its responsibilities for the completed work nor the surety of its obligation for and concerning any just claims arising out of the Work performed.

## **21.0 ISSUANCE OF NOTICE OF COMPLETION AND FINAL ACCEPTANCE BY OWNER**

**21.1** Upon completion of the Project, a Final Inspection shall be requested by the Contractor in writing and the Owner will make an inspection within seven (7) days. If all construction provided for and contemplated by the contract is found completed to his satisfaction, that inspection shall constitute the final inspection and the Owner will make the final acceptance and issue a Certificate Of Completion to the Contractor.

If, however, the inspection discloses any Work, in whole or in part, as being unsatisfactory, the Owner will give the Contractor the necessary instructions for correction of same, and the Contractor shall immediately comply with and execute such instructions. Upon correction of the Work, another inspection will be made which shall constitute the final inspection provided the Work has been satisfactorily completed. In such event, the Owner will make the final acceptance and issue a Certificate Of Completion to the Contractor.

## **22.0 PAYMENTS TO CONTRACTOR**

**22.1** In addition to any documents required by the Engineer to be submitted to Engineer at the time a partial pay estimate is submitted, including partial lien released as specified in Section 22.9 of the General Conditions, the Contractor shall, at least ten (10) days before each progress payment falls due (but not more often than once a month), submit to the Engineer a partial payment estimate filled out and signed by the Contractor covering the Work performed during the period covered by the partial payment estimate and supported by such data as the Engineer may reasonably require. If payment is requested on the basis of materials and equipment not incorporated in the Work, title to such materials and equipment shall vest in the Owner, and Contractor shall supply, at the time of submission of payment estimate, supporting documents satisfactory to the Owner, to establish and protect Owner's interest in the materials and equipment, and Contractor shall maintain appropriate insurance on same until such time as actual possession by the Owner of the materials and equipment shall occur. The Engineer will, within seven (7) days after receipt of each partial payment estimate, either indicate in writing his approval of payment and present the partial payment estimate to the Owner or return the partial payment estimate to the Contractor indicating in writing his reasons for refusing to approve payment. In the latter case, the Contractor may make the necessary corrections and resubmit the partial payment estimate. The Owner will, within fourteen (14) days of presentation to him of an approved partial payment estimate, pay the Contractor a progress payment on the basis of the approved partial payment estimate. The Owner shall retain ten (10) percent of the amount of each payment until final completion and acceptance of all Work covered by the Contract Documents. When the Contract is fifty percent completed, one-half of the amount retained shall be paid to the Contractor provided the Contractor makes a written request for the payment and the Contractor is making satisfactory progress on the Contract and there is no specific cause or claim requiring a greater amount to be retained. After the Contract is fifty per cent completed, no more than five per cent of the amount of any subsequent

progress payments made under the Contract may be retained providing the Contractor is making satisfactory progress on the project, except that if at any time the Owner determines satisfactory progress is not being made, ten per cent retention shall be reinstated for all progress payments made under the Contract subsequent to the determination.

**22.2** In lieu of ten percent (10%) retention provided for in paragraph 22.1, of this Article, the Owner shall, at the Contractor's option, accept as a substitute an assignment of any of the following:

- A. Time certificates of deposit of banks licensed by the State of Arizona; or
- B. Securities of or guaranteed by the United States of America; or
- C. Securities of the State of Arizona, or any county, municipality or school district thereof; or
- D. Shares of savings and loan institutions authorized to transact business in the State of Arizona.

Such assigned instruments shall have a face value in an amount equal to ten percent (10%) of the progress payment for which such instruments are tendered and shall be retained by the Owner as a guarantee for complete performance of the Contract.

In the event the Owner accepts substitute security as provided herein for the ten percent (10%) retention, the Contractor shall be entitled to all interest or income earned by such security, and all such security in lieu of retention shall be returned to the Contractor within sixty (60) days after final completion and acceptance of all material, equipment and work covered by the contract if the Contractor has furnished the Owner satisfactory receipts for all labor and material billed and waivers of liens from any and all persons holding claims against the work.

In no event shall the Owner accept a time certificate of deposit of a bank or shares of a savings and loan institution in lieu of the retention specified in paragraph 22.1 of this Article unless accompanied by a signed and acknowledged waiver of the bank or savings and loan institution of any right or power to set off against either the Owner or the Contractor in relationship to the certificates or shares assigned.

**22.3** The Contractor shall promptly pay each Subcontractor, upon receipt of payment from the Owner out of the amount paid to the Contractor on account of such Subcontractors' Work, the amount to which said Subcontractor is entitled, reflecting the percentage actually retained, if any, from payments to the Contractor on account of such Subcontractors' Work. The Contractor shall, by an appropriate Contract with each Subcontractor, require each Subcontractor to make payments to his Sub-subcontractors in similar manner.

**22.4** Prior to Substantial Completion, the Owner, with the approval of the Engineer and with the concurrence of the Contractor, may use any completed or substantially completed portions of the Work. Such use shall not constitute an acceptance of such portions of the Work.

**22.5** The Owner shall have the right to enter the premises for the purpose of doing Work not covered by the Contract Documents. This provision shall not be construed as relieving the Contractor of the sole responsibility for the care and protection of the Work, or the restoration of any damaged Work except such as may be caused by agents or employees of the Owner.

**22.6** Upon final completion and acceptance of the Work, the Engineer shall issue a certificate attached to the final payment request that the Work has been accepted under the conditions of the Contract Documents. No retention of payments may be delayed or retained without a specific written finding by the Engineer or Owner of the reasons justifying the delay in payment. The entire balance found to be due the Contractor, including the retained percentages, except the amount necessary to pay the expenses the Owner reasonably expected to incur in order to pay or discharge the expenses determined by the Engineer or Owner in the finding justifying the retention or delay, shall be paid to the Contractor, within sixty (60) days of completion or proper filing of the Notice of Completion.

**22.7** The Contractor shall indemnify and save the Owner or the Owner's agents harmless from all claims growing out of the lawful demands of Subcontractors, laborers, workmen, mechanics, materialmen, and furnishers of machinery and parts thereof, equipment, tools, and all supplies, incurred in the furtherance of the performance of the Work. The Contractor shall, at the Owner's request, furnish satisfactory evidence, in the form of lien releases or other documents deemed appropriate by the Owner, that all obligations of the nature designated above have been paid, discharged, or waived. If the Contractor fails to do so the Owner may, after having notified the Contractor, either pay unpaid bills 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 the Contract Documents, but in no event shall the provisions of this sentence be construed to impose any obligations upon the Owner to either the Contractor, his Surety, or any third party. In paying any unpaid bills of the Contractor, any payment so made by the Owner shall be considered as a payment made under the Contract Documents by the Owner to the Contractor and the Owner shall not be liable to the Contractor for any such payments made in good faith.

**22.8** If any payment to Contractor is delayed after the date due, interest shall be paid at the rate of one percent per month or fraction of a month on such unpaid balance as may be due. If the Owner fails to make payment sixty (60) days after final completion and acceptance, in addition to other remedies available to the Contractor, interest shall be paid at the rate of one per cent per month or fraction of the month on such unpaid balance as may be due, except for that amount necessary to pay the expenses the Owner reasonably expects to incur in order to pay or discharge the expense determined by the Engineer or Owner in the finding justifying the retention or delay.

**22.9** The Owner may require the Contractor to furnish partial releases or liens executed by all persons, firms and corporations who have furnished labor services or materials incorporated into the Work during the period of time for which the progress payment is due, releasing such lien rights as these persons, firms or corporations may have for that

period.

## **23.0 ACCEPTANCE OF FINAL PAYMENT AS RELEASE**

**23.1** Following the Owner's acceptance of the Work, the Owner will issue a Notice of Completion to the Contractor. Sixty days after the issuing of the Notice of Completion, and upon receipt of the necessary Unconditional lien releases executed by all persons, firms and corporations who have furnished labor services or materials incorporated into the work evidencing that all liabilities have been fully discharged, the Owner will pay to the Contractor the entire sum so found to be due after deducting therefrom all previous payments and all amounts to be kept and all amounts to be retained under the provisions of the Contract. All previous prior partial estimates and payments shall be subject to correction in the final estimate and payment.

**23.2** 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 other than claims in stated amounts as may be specifically excepted by 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. Any payment, however, final or otherwise, shall not release the Contractor or his sureties from any obligations under the Contract Documents or the Performance Bond and Payment Bonds.

## **24.0 INSURANCE**

**24.1** The Contractor shall give special attention to Section 00500-A of the Bid Documents when preparing a bid, which outline the insurance requirements of Owner and the Contractor shall consider these insurance requirements part of the Bid/Contract documents.

The Contractor shall purchase and maintain such insurance as will protect him from claims set forth below which may arise out of or result from the Contractor's execution of the Work, whether such execution be by itself or by any Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:

- A. Claims under worker's compensation, disability benefit and other similar employee benefit acts;
- B. Claims for damages because of bodily injury, occupational sickness or disease, or death of his employees;
- C. Claims for damages because of bodily injury, sickness or disease, or death of any person other than his employees;
- D. Claims for damages insured by usual personal injury liability coverage which are sustained (1) by any person as a result of an offense directly or indirectly related to the employment of such person by the Contractor, or (2) by any other person; and

- E. Claims for damages because of injury to or destruction of tangible property, including loss of use resulting therefrom.

The Contractor is responsible to respond to claims arising as a result of its work. See Section 500-B for specific procedures.

**24.2** Certificates of Insurance acceptable to the Owner shall be filed with the Owner prior to commencement of the Work. These Certificates shall contain a provision that coverages afforded under the policies will not be canceled unless at least ten (10) days prior Written Notice has been given to the Owner, "Attention: Contract Administrator, 2330 McCulloch Boulevard North, Lake Havasu City, AZ, 86403".

**24.3** The Contractor shall procure and maintain, at its own expense, during the Contract Time, liability insurance as specified in Section 500-A, incorporated herein.

## **25.0 CONTRACT SECURITY**

**25.1** The Contractor shall within ten (10) days after the receipt of the Notice Of Award furnish the Owner with a Performance Bond and a Payment Bond in sums equal to the amount of the Contract PRICE, conditioned upon the performance by the Contractor of all undertakings, covenants, terms, conditions and Contracts of the Contract Documents, and upon the prompt payment by the Contractor to all persons supplying labor and materials in the prosecution of the Work provided by the Contract Documents. Such Bonds shall be executed by the Contractor and a corporate bonding company licensed to transact such business in the state in which the Work is to be performed and named on the current list of "Surety Companies Acceptable on Federal Bonds" as published in the Treasury Department Circular Number 570. The expense of these Bonds shall be borne by the Contractor. If at any time a surety on any such Bond is declared a bankrupt or loses its right to do business in the state in which the Work is to be performed or is removed from the list of Surety Companies accepted on Federal Bonds, Contractor shall within ten (10) days after notice from the Owner to do so, 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 an acceptable Bond to the Owner.

## **26.0 ASSIGNMENTS**

**26.1** Neither the Contractor nor the Owner shall sell, transfer, assign or otherwise dispose of the Contract or any portion thereof, or of his right, title or interest therein, or his obligations thereunder, without written consent of the other party. Nor shall the Contractor assign any monies due or to become due to him hereunder without the previous written consent of the Owner.

**26.2** The Owner and Contractor each bind itself, its partners, successors and assigns and legal representatives to the other party hereto and to the partners, successors, assigns and legal

representatives of such other party in respect to all covenants, Contracts and obligations contained in the Contract Documents.

## **27.0 INDEMNIFICATION**

**27.1** Contractor shall indemnify and hold harmless City, its officers and employees from and against any and all liabilities, damages, losses, and costs, including reasonable attorney's fees, but only to the extent caused by the negligence, recklessness, or intentional wrongful conduct of Contractor or other persons employed or used by the Contractor in the performance of this Contract. It is agreed that Contractor will be responsible for primary loss investigation, defense, and judgment costs where this indemnification is applicable.

**27.2** In any and all claims against the Owner or the Engineer, or any of their agents or employees, by any employee of the Contractor, any Subcontractor, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, the indemnification obligation shall not be limited in any way by any limitation on the amount or type of damages, compensation of benefits payable by or for the Contractor or any Subcontractor under worker's compensation acts, disability benefit acts or other employee benefits acts.

**27.3** The obligation of the Contractor under this paragraph shall not extend to the liability of the Engineer, his agents or employees arising out of the preparation or approval of maps, DRAWINGS, opinions, reports, surveys, Change Orders, designs or Specifications.

## **28.0 SEPARATE CONTRACTS**

**28.1** The Owner reserves the right to let other contracts in connection with this Project. The Contractor shall afford other Contractors reasonable opportunity for the introduction and storage of their materials and the execution of their Work, and shall properly connect and coordinate its Work with theirs. If the proper execution or results of any part of the Contractor's Work depends upon the Work of any other Contractor, the Contractor shall inspect and promptly report to the Engineer any defects in such Work that render it unsuitable for such proper execution and results.

**28.2** The Owner may perform additional Work related to the Project by itself, or it may let other contracts containing provisions similar to these. The Contractor shall afford the other Contractors who are parties to such Contracts (or the Owner, if he is performing the additional Work himself), reasonable opportunity for the introduction and storage of materials and equipment and the execution of Work, and shall properly connect and coordinate his Work with theirs.

**28.3** If the performance of additional Work by other Contractors or the Owner is not noted in the Contract Documents prior to the execution of the Contract, written notice thereof shall be given to the Contractor prior to starting any such additional Work. If the Contractor believes that the performance of such additional Work by the Owner or others involves it in additional expense or entitles him to an extension of the Contract Time, it may make a claim therefore as

provided in Sections 16 and 17.

## **29.0 SUBCONTRACTING**

**29.1** The Contractor may utilize the services of specialty Subcontractors on those parts of the Work which come under normal contracting practices or are typically performed by specialty Subcontractors, provided the Contractor, simultaneously with the delivery of the executed Contract, shall furnish to the Owner and the Engineer in writing the names of the persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for each of the principal portions of the Work. The engineer will promptly reply to the Contractor in writing stating whether or not the Owner or the Engineer, after due investigation, has reasonable objection to any such proposed person or entity. Failure of the Owner or Engineer to promptly reply shall constitute notice of no reasonable objection. The Contractor shall not contract with any such proposed person or entity to whom the Owner or Engineer has made reasonable objection and the Contractor shall not be required to contract with anyone to whom he has a reasonable objection. If the Owner or Engineer has a reasonable objection to any proposed person or entity, the Contractor shall submit a substitute to whom the Owner or the Engineer has no reasonable objection. The Contractor shall make no substitution for any Subcontractor, person or entity previously selected if the Owner or Engineer makes reasonable objection to such substitution.

**29.2** The Contractor shall not award Work to Subcontractor(s), in excess of forty-nine (49%) percent of the Contract Price, without prior written approval of the Owner.

**29.3** The Contractor shall be fully responsible to the Owner for the acts and omissions of its Subcontractors, and of persons either directly or indirectly employed by them, as it is for the acts and omissions of persons directly employed by it.

**29.4** The Contractor shall not employ any Subcontractors that are not properly licensed with Lake Havasu City and the State of Arizona. Changes of Subcontractors listed with the Proposal shall be made only with the approval of the Owner.

**29.5** Nothing contained in these Contract Documents shall be construed as creating any contractual relationship between any Subcontractor and the Owner; the Contractor shall be as fully responsible to the Owner for the acts and omissions of Subcontractors, and of persons employed by them, as he is for the acts and omissions of persons directly employed by him.

**29.6** The Contractor shall, without additional expense to the Owner, utilize the services of specialty Subcontractors on those parts of the Work which are specified or required by State or local laws to be performed by specialty Subcontractors.

**29.7** The Contractor shall be responsible for the coordination of all trades, Subcontractors, material and people engaged upon this Work. The Owner will not undertake to settle any differences between the Contractor and his Subcontractors or between Subcontractors.

**29.8** 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 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.

**29.9** Nothing contained in this Contract shall create any contractual relation between any Subcontractor and the Owner.

### **30.0 ENGINEER'S AUTHORITY**

**30.1** The Engineer shall act as the Owner's representative during the construction period. The Engineer shall decide questions which may arise as to quality and acceptability of materials furnished and Work performed and shall interpret the intent of the Contract Documents in a fair and unbiased manner. The Engineer will make periodic visits to the site and determine if the Work is proceeding in accordance with the Contract Documents.

**30.2** The Contractor will be held strictly to the intent of the Contract Documents in regard to the quality of materials, workmanship and execution of the Work. Inspections may be made at the factory or fabrication plant of the source of material supply.

**30.3** The Engineer shall not be responsible for the construction means, controls, techniques, sequences, procedures, or construction safety precautions and programs in connection with the Work and will not be responsible for the Contractor's failure to carry out the Work in accordance with the Contract Documents. The Engineer shall not be responsible or have control or charge over the acts or omissions of the Subcontractors, or any of their agents or employees, or any other person performing any of the Work.

**30.4** The Engineer shall promptly make decisions relative to interpretation of the Contract Documents.

**30.5** The Engineer will have the authority to reject Work which does not conform to the Contract Documents. Whenever, in its opinion, it is considered necessary or advisable for the implementation of the intent of the Contract Documents, the Engineer will have authority to require special inspection or testing of the Work in accordance with the other terms of this Contract whether or not such Work be then fabricated, installed or completed.

### **31.0 LAND AND RIGHTS-OF-WAY**

**31.1** Prior to issuance of Notice To Proceed, the Owner shall obtain all land and rights-of-way necessary for carrying out and for the completion of the Work to be performed pursuant to the Contract Documents, unless otherwise mutually agreed.

**31.2** The Owner shall provide to the Contractor information which delineates and describes the lands owned and rights-of-way acquired.

**31.3** The Contractor shall provide at its own expense and without liability to the Owner any

additional land and access thereto that the Contractor may desire for temporary construction facilities, or for storage of materials.

## **32.0 GUARANTEE**

**32.1** Except as otherwise specified, all Work shall be guaranteed by the Contractor against defects resulting from the use of inferior materials, equipment, or workmanship for a period of one (1) year from the date the Certificate of Substantial Completion is issued by the Owner, or within such longer period of time as may be prescribed by law or by the terms of any applicable special guarantee required by the Contract Documents.

**32.2** If, within any guarantee period, repairs or changes are required in connection with guaranteed Work, which, in the opinion of the Owner, is rendered necessary as the result of the use of materials, equipment, or workmanship which are inferior, defective, or not in accordance with the terms of the Contract, the Contractor shall, promptly upon receipt of notice from the Owner, and without expense, (1) place in satisfactory condition in every particular all of such guaranteed Work, correcting all defects therein; (2) make good all damage to the building, site or Work, or equipment or contents thereof, which in the opinion of the Owner, is the result of the use of materials, equipment, or workmanship which are inferior, defective, or not in accordance with the terms of the contract; and (3) make good any Work or material, or the equipment and contents of said building, site or Work disturbed in fulfilling any such guarantee. If the Contractor, after notice, fails to proceed promptly to comply with the terms of the guarantee, the Owner may have the defects corrected and the Contractor and his surety shall be liable for all expense incurred. The Performance Bond shall remain in full force and effect through the guarantee period.

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**GUARANTEE**

**32.3** The Contractor agrees to execute, and to cause each Subcontractor to execute, a written guarantee to the Owner, in substantially the following form:

GUARANTEE FOR:

We hereby guarantee, both jointly and severally, that the improvement which we have installed for the Owner of Project, specifically described as:

**Project Name & Project No. \_\_\_\_\_**

has been done in accordance with the Contract Drawings and Specifications.

We agree, both jointly and severally, to repair and replace any or all Work included in said improvement, together with any other adjacent work which may be displaced or damaged by so doing, that may prove to be defective in its workmanship or material within a period of one year from date of the Certificate of Substantial Completion, ordinary wear and tear and unusual abuse or neglect accepted.

In the event of our failure to comply with the above mentioned conditions within a reasonable period of time (as determined by the Owner) after being notified in writing by the Owner, we both jointly and severally, do hereby authorize the Owner to proceed to have said defects repaired and made good at our expense, and we will honor and pay the costs and charges therefore upon demand.

Signed \_\_\_\_\_

Countersigned \_\_\_\_\_

Local Representative to be contacted for service:

Name \_\_\_\_\_

Address \_\_\_\_\_

Phone No. \_\_\_\_\_

FAX \_\_\_\_\_

The guarantee form(s) shall be completed and returned with the acknowledgement of the Certificate of Completion.

The failure of the Contractor or any Subcontractor to execute, such guarantee shall not affect the right of the Owner to rely on and enforce the guarantee and the obligations respectively assumed by the Contractor and each Subcontractor under Subparagraph 32.1 and 32.2 hereof.

### **33.0 ARBITRATION**

**33.1** Provided both parties mutually agree, all claims, disputes and other matters in question arising out of, or relating to, the Contract Documents or the breach thereof, except for claims which have been waived by the making and acceptance of final payment as provided by Section 23, may be decided by arbitration in accordance with the American Arbitration Association or any other similar body. The foregoing Contract to arbitrate shall be specifically enforceable under the prevailing arbitration law (Arizona Revised Statutes Sections 12-1501, *et seq.*) of the State of Arizona. The award rendered by the arbitrators shall be final, and judgment may be entered upon it in any court having jurisdiction thereof.

**33.2** Notice of the demand for arbitration shall be filed in writing with the other party to the Contract Documents and with the American Arbitration Association and a copy shall be filed with the Engineer. The party filing for arbitration may select which arbitration service to use. Demand for arbitration shall in no event be made on any claim, dispute or other matter in question which would be barred by the applicable statute of limitations.

**33.3** The Contractor shall carry on the Work and maintain the progress schedule during any arbitration proceedings, unless otherwise mutually agreed in writing.

**33.4** The provisions of the Contract pertaining to arbitration are not binding upon Engineer and Engineer cannot be compelled to participate against his will in an arbitration arising out of a dispute over the Contract or Contract Documents unless Engineer so consents in writing to be a party to the arbitration.

### **34.0 TAXES AND CHARGES**

**34.1** The Contractor shall pay all State and local sales and use taxes on items, and in a manner as required by the laws and statutes of the State of Arizona and its political subdivisions. The Contractor shall withhold and pay any and all withholding taxes, whether State or Federal, and pay all Social Security charges, State Unemployment Compensation charges, industrial insurance, workers compensation charges, and pay or cause to be withheld, as the case may be, any and all taxes, charges, or fees, or sums whatsoever, which are now or may hereafter be required to be paid or withheld under any laws.

### **35.0 MISCELLANEOUS CONDITIONS**

**35.1** In the event that either party to the Contract is required to institute arbitration or

litigation to enforce its rights under the terms of the Contract, then the prevailing party in the arbitration or litigation shall be entitled to recover all costs and attorney's fees incurred.

**35.2** In the event that any provision contained in the Contract is found to be contrary to the applicable law, then it shall be severed and the remaining provisions of the Contract shall remain in full force and effect.

**35.3** The Contract shall be governed by the laws of the State of Arizona.

### **36.0 CONFLICTS WITHIN THE PLANS OR SPECIFICATIONS**

**36.1** In the event that a conflict is discovered between sections of the Specifications or between the Plans and the Specifications, the following list of priority shall be used to resolve the conflict:

- A. Executed Change Orders
- B. Addenda
- C. Contract
- D. Special Provisions
- E. General Conditions
- F. Instructions to Bidders
- G. Technical Specifications
- H. Plans
- I. Referenced Standard Specifications or Other Documents

### **37.0 NONDISCRIMINATION**

**37.1** The Contractor, with regard to the work performed pursuant to this contract, shall not discriminate on the grounds of race, color, sex, religion, creed, age, physical or mental disability, or national origin or ancestry in any contracts with the public and in the selection and retention of employees or subcontractors, nor in the procurement of materials and leases of equipment.

### **38.0 INTEGRATION**

**38.1** This Contract represents the entire Contract between the parties hereto and supersedes any and all prior negotiations or representations, either written or oral.

**38.2** Amendments or modifications to the Contract shall be in writing, signed by both parties, or by Change Orders.

**38.3** The Contract Documents shall not be construed to create any contractual relationship of any kind between the Engineer and the Contractor, but the Engineer shall be entitled to performance of obligations intended for his benefit, and to the enforcement thereof.

### **39.0 HAZARD COMMUNICATION PROGRAM**

**39.1** All contractors working on City projects shall submit a copy of their hazard communication plan to the Fire Prevention Office prior to commencement of work on any project. This will ensure that other individuals on the job site are not unknowingly exposed to a hazardous substance or chemical.

The Fire Prevention Office shall be provided a list of the hazardous substances and the material safety data sheets that are applicable to the work areas of those contract employees.

All contract labor within City facilities will be treated the same as regular employees with regard to this hazard communication standard.

\*\* END OF SECTION \*\*

SECTION 00800  
**SPECIAL PROVISIONS**

**1.0 SCOPE**

These Special Provisions supplement and modify the General Conditions, Technical Specifications, and Plans. All requirements and provisions of the General Conditions, Technical Specifications and Plans apply except where modified by these Special Provisions.

**2.0 PROJECT DESCRIPTION**

This project consists of the demolition and remodeling of an existing room located in the Lake Havasu City Police Station to accommodate a new IT Server Room. The project includes but not limited to new air handlers, a raised floor, fire suppression, new lighting, data and electrical components.

**3.0 DEFINITION OF TERMS**

Wherever in these documents the word "OWNER" appears, it shall be understood to mean Lake Havasu City, Arizona, the governing body of which is the City Council. Wherever in these documents the word "CONTRACTOR" appears, it shall be understood to mean the party or parties contracting with the Owner to perform the Work. Wherever in these documents the word "ENGINEER" appears, it shall be understood to mean Lake Havasu City Public Works Department, Engineering Division.

**4.0 PRECONSTRUCTION CONFERENCE**

Within ten (10) days after the contract has been awarded, but before the start of construction, the ENGINEER will schedule a conference to be held at the site of the project for the purpose of discussing such matters as project supervision, onsite inspections, progress schedules and reports, payrolls, payments to Contractors, equal employment opportunity, contract change orders, insurance, safety, and any other items pertinent to the project. The Contractor shall arrange to have all supervisory personnel connected with the project on hand to meet with the representatives of the Owner and the Engineer.

**5.0 COMPLIANCE WITH LAWS AND LABOR MATERIAL REQUIREMENTS**

The Contractor shall conduct the work in compliance with all existing state and national laws and county and municipal ordinance and regulations limiting or controlling the work in any manner. Particular attention is called to the following State of Arizona laws:

**WORKMAN'S COMPENSATION INSURANCE** All personnel working on the project shall be covered by Workmen's Compensation Insurance as provided or approved by the Arizona Industrial Commission in accordance with ARS 23-901 et. seq.

**EMPLOYMENT OF ALIENS** Employment of aliens on Public Works projects prohibited. ARS 34-301 and residence requirements for employees, ARS 34-302.

The Contractor understands and acknowledges the applicability to it of the American with Disabilities Act, the Immigration Reform and Control Act of 1986 and the Drug Free Workplace Act of 1989. The following is only applicable to construction contracts: The Contractor must also comply with A.R.S. § 34-301, "Employment of Aliens on Public Works Prohibited", and A.R.S. § 34-302, as amended, "Residence Requirements for Employees".

Under the provisions of A.R.S. §41-4401, Contractor hereby warrants to the City that the Contractor and each of its subcontractors ("Subcontractors") will comply with, and are contractually obligated to comply with, all Federal Immigration laws and regulations that relate to their employees and A.R.S. §23-214(A) (hereinafter "Contractor Immigration Warranty").

A breach of the Contractor Immigration Warranty shall constitute a material breach of this Contract and shall subject the Contractor to penalties up to and including termination of this Contract at the sole discretion of the City.

The City retains the legal right to inspect the papers of any Contractor or Subcontractors employee who works on this Contract to ensure that the Contractor or Subcontractor is complying with the Contractor Immigration Warranty. Contractor agrees to assist the City in regard to any such inspections.

The City may, at its sole discretion, conduct random verification of the employment records of the Contractor and any of subcontractors to ensure compliance with Contractor's Immigration Warranty. Contractor agrees to assist the City in regard to any random verifications performed.

Neither the Contractor nor any of Subcontractor shall be deemed to have materially breached the Contractor Immigration Warranty if the Contractor or Subcontractor establishes that it has complied with the employment verification provisions prescribed by sections 274A and 274B of the Federal Immigration and Nationality Act and the E-Verify requirements prescribed by A.R.S. §23-214, Subsection A.

The provisions of this Article must be included in any contract the Contractor enters into with any and all of its subcontractors who provide services under this Contract or any subcontract. "Services" are defined as furnishing labor, time or effort in the State of Arizona by a contractor or subcontractor. Services include construction or maintenance of any structure, building or transportation facility or improvement to real property.

## **6.0 COPIES OF DOCUMENTS**

The Owner will furnish to the Contractor one electronic copy of the Contract Documents in pdf format, unless otherwise requested.

## **7.0 DRAWINGS OF RECORD**

Two sets of the Contract Documents are to be kept at the job site, maintained in good condition, and marked daily by the Contractor as the work proceeds. The Contract Documents shall be kept available for inspection by the OWNER at all times, and shall be kept up to date.

## **8.0 CONTRACT TIME**

The contract time shall be XX CALENDAR DAYS from the NOTICE to PROCEED.

## **9.0 SURVEYS**

The CONTRACTOR shall layout the WORK, in accordance with the drawings, shall establish all necessary lines, etc., required to complete the work in accordance with the Contract Documents. The CONTRACTOR shall employ an experienced and competent Arizona Registered Land Surveyor (R.L.S.) satisfactory to the OWNER to layout the WORK and to verify lines and elevations as the WORK progresses.

## **10.0 WEATHER CONDITIONS**

In the event of temporary suspension of work, or during inclement weather, or whenever the OWNER 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 OWNER, 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 to so protect his work, such materials shall be removed and replaced at the expense of the Contractor.

## **11.0 SUBMITTALS**

Prior to construction and as soon as possible, the Contractor shall supply all submittals required by the Technical Specifications or as requested by the Owner.

## **12.0 INSPECTION OF THE WORK**

The Owner intends to provide a full-time resident inspector for the project. The resident inspector will be available for a forty (40) hour period during the week from Monday through Friday during the period of the Contract. In the event the Contractor elects to work outside the forty (40) hour week that occurs between Monday through Friday, such as Saturday, Sunday or legal holidays, in accordance with Section 17.0 of the General Conditions the Contractor will be responsible for all inspection, engineering, and testing costs incurred during that period. For any inspection work performed on Saturday, Sunday, or local municipal holidays the minimum chargeable time shall be four (4) hours. The Owner reserves the right to deduct these additional inspection, engineering, and testing costs directly from the Contractor's payments.

## **13.0 WATER AND POWER**

### **A. WATER**

Water is available from the Water Department at no cost to the Contractor. The Contractor shall make application and obtain a hydrant meter from the Water Department for the purpose of metering the use of water on the project. The Contractor shall adhere to all conditions stated in the Meter Application, including payment of a deposit for the meter,

return of the meter to the Water Department each month during the project for reading, and notification to the Water Department prior to any change in the location of the hydrant meter. The maximum water to be drawn off a hydrant at any time is 200 gpm (water drawn from 4" hydrant whenever available). Water shall only be drawn off hydrants approved by the Lake Havasu City Water Superintendent or his authorized representative.

**B. POWER**

All power for lighting, operation of Contractor's plant or equipment or for any other use as may be required for proper completion of the work to be performed under the provisions of these contract documents, shall be provided by the Contractor at his sole cost and expense.

**14.0 BURNING OF VEGETATION**

No burning of vegetation will be allowed.

**15.0 MATERIALS TESTING**

**A. CONSTRUCTION TESTING**

All quality control testing must be provided by CONTRACTOR. The material and workmanship provided during construction will be tested on a regular basis by the CONTRACTOR. It shall be the responsibility of the CONTRACTOR, at no additional cost, to provide material samples for testing at the **OWNER's** request.

The CONTRACTOR shall be responsible for charges resulting from failed tests, costs for retesting shall be based upon hourly and/or individual test rates.

In the event any portion of the project is rejected because of substandard work, all materials testing, engineering, and inspection costs associated with corrective measures shall be chargeable to the CONTRACTOR at the current respective rates.

**B. PRELIMINARY MATERIALS TESTING**

All preliminary materials testing and mix design testing required by the specifications to ensure materials and mix designs are suitable for project use will be the responsibility of the CONTRACTOR at no additional cost to the OWNER.

## **16.0 CLEANUP AND POLLUTION CONTROL**

### **A. GENERAL**

The CONTRACTOR shall be responsible for the removal of all debris, litter and waste from the job site(s) and/or equipment maintenance area and the restoration of any and all areas affected, directly or indirectly by the construction, transportation of equipment or materials and/or by the acts of neglect or omission by his employees.

All debris, litter, etc., shall be disposed of in accordance with prevailing ordinance or law. Open burning of trash, debris, etc., will not be permitted.

Such clean-up operations shall be on a daily basis. All pavement, concrete, brush, rocks, excess materials, etc. accumulated or removed during the course of construction must be disposed of in those areas designated by the Engineer or his authorized representative, including but not limited to the Lake Havasu City Landfill. All costs for disposal, including gate or tipping fees, etc. are the responsibility of the Contractor. This material must be disposed of within ten (10) days of time of removal. If the areas in question are not cleaned up to the satisfaction of the ENGINEER, progress payments will be withheld until clean-up is completed and approved by the ENGINEER, or, in the case of private projects, other legal action will be taken.

### **B. TEMPORARY FACILITIES**

The CONTRACTOR shall provide temporary mailboxes and traffic control signs where necessary until completion of backfilling and clean-up.

### **C. SOLID WASTES**

All solid wastes shall be removed and disposed of in accordance with prevailing ordinance or law. Clean-up shall be completed on a daily basis. All costs for disposal shall be the responsibility of the Contractor, and shall be considered incidental to the costs of the various bid items.

All spilled paving material shall be removed and disposed of prior to final acceptance and payment.

### **D. MAINTENANCE AREAS**

Maintenance areas shall be kept clean during construction and shall be free of litter at all times. All empty containers, debris, waste, etc., shall be removed and disposed of prior to final acceptance. Upon inspection by the ENGINEER, the CONTRACTOR may be required to dress the surface of the ground, dependent upon the extent of spillage of petroleum products on the surface. If so directed, such dressing shall consist of scarifying the surface to a depth of six (6) inches and moving and compacting the soil in such a way as to blend the spill areas into clean soil and restore the surface by partial compaction.

### **E. POLLUTION**

The CONTRACTOR shall be held responsible for acts leading to pollution of water, air or land by any means.

Open burning of trash, debris, etc., will not be permitted anywhere in the City limits.

The discharge of any pollutants upon the surface of the ground, or into any stream, ravine, wash or body of water which may result in pollution of the public water supply, or of groundwater contributory thereto, will not be permitted.

Violation of these conditions will be cause for the termination of work, and possible legal action.

**F. REMOVAL AND REPLACEMENT OF SIGNS, MAILBOXES, ETC.**

It is the responsibility of the CONTRACTOR to remove all poles, etc. which are located within the construction area and replace at the time of backfilling and clean-up in the locations determined by the Street Superintendent. In the case of landscaping or other private items located in the construction area, the CONTRACTOR shall hand-deliver a written notice to all residences in that area stating his intentions to perform construction activities and shall do so at least five (5) working days prior to work commencing. If, at the time of construction these items are still in the construction area, the CONTRACTOR is to remove and dispose of them properly. All signs and mailboxes shall be permanently installed within forty-eight (48) hours of completion of construction activities.

**G. NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) GENERAL PERMIT**

At the time of the preconstruction conference, the contractor shall submit, for the Engineer's approval, a program which includes all the measures which the contractor proposes to take for the construction of permanent erosion control work specified in the contract and all the temporary control measures to prevent erosion and pollution of streams, lakes and reservoirs.

Permanent erosion control work and pollution prevention measures shall be performed at the earliest practicable time consistent with good construction practices. Temporary work and measures are not meant to be performed in lieu of permanent work specified in the contract.

Construction of drainage facilities as well as the performance of other contract work which will contribute to the control of erosion and sedimentation shall be carried out in conjunction with earthwork operations or as soon thereafter as possible.

Except for that approved in writing by the Engineer, the contractor shall perform no clearing and grubbing or earthwork until the contractor's program has been approved.

If in the opinion of the Engineer, clearing and grubbing, excavation, or other construction operations are likely to create an erosion problem because of the exposure of erodible earth material, the Engineer may limit the surface area to be disturbed until satisfactory control measures have been accomplished. Unless otherwise permitted by the Engineer, the

contractor shall not expose an area of erodible earth material greater than 217,800 square feet at any one location.

The Engineer may order the contractor to provide immediate measures to control erosion and prevent pollution. Such measures may involve the construction of temporary berms, dikes, dams, sediment basins and slope drains; the use of temporary mulches, mats and seeds and the use of other devices, methods, items, etc., as necessary.

At any time the contractor proposes to change his/her schedule of operations, the contractor shall review and update his/her erosion and pollution control program and submit it to the Engineer for approval.

The contractor shall not be entitled to additional compensation or an extension of contract time for any delays to the work because of the contractor's failure to submit an acceptable erosion and pollution control program.

Erosion control and pollution prevention work specified in the contract which is to be accomplished under any of the various contract items will be paid for by the bid item. Any additional work required by the Owner will be paid for by the Force Account set up for this work.

The cost of any erosion control and pollution prevention work which may be proposed by the contractor in his/her program, in addition to that specified in the contract, will be considered as included in the prices bid for contract items.

## **17.0 DUST CONTROL**

It shall be the Contractor's responsibility to provide adequate water for dust control. It is imperative that the air quality standards are maintained. In addition, dust could be quite hazardous in the everyday operations. It shall be the Contractor's responsibility to ensure that all regulations for air quality and safety are met.

## **18.0 SUPERVISORY PERSONNEL**

It is the intent of these Specifications to provide a completed project which will in every way reflect the work of competent journeyman mechanics in the various trades represented. The Contractor shall ensure that each portion of the work is supervised by a qualified person, well versed in the operation of the various tools required for the trade, the method in which the work is to be done, and a knowledge of the general requirements of the construction work. All work is to be done in accordance with the latest methods devised for such work to ensure the highest quality product.

## **19.0 SAFETY REQUIREMENTS**

The Contractor shall comply with all pertinent provisions of the Department of Labor "Safety and Health Regulations for Construction" (29 CFR Part 1518, 36 CFR 7340), with additions or modifications thereto, in effect during construction of this project.

### **THE FOLLOWING MEASURES OR PROVISIONS ARE TO BE ADHERED TO AT ALL TIMES DURING THE CONSTRUCTION OF THIS PROJECT:**

- A. All heavy construction machinery to include trenching machines, bulldozers, backhoes, etc., must be equipped with a roll bar meeting the requirements of the above regulation.
- B. Safety helmets will be worn by all personnel working at the site. In addition, all spectators and inspectors will be required to wear safety helmets in construction zone.
- C. Steel toe safety shoes or boots will be worn by all personnel working at the site.

## **20.0 PRESERVATION OF BENCH MARKS AND MONUMENTS**

The Contractor shall exercise caution to ensure that permanent bench marks, monuments, established property corners, survey lines, and points are not damaged or disturbed by this work. If any survey monuments, property corners, survey lines or points are damaged or disturbed, the Contractor's representative shall immediately notify the inspector. All centerline survey monumentation located in pavement removal areas shall be replaced by an Arizona Registered Land Surveyor (R.L.S.) after completion of the pavement removal and replacement operations. All costs incurred to re-establish such points shall be borne by the Contractor.

## **21.0 DISPOSAL OF EXCESS MATERIAL**

Excess soil and unsuitable materials shall be removed from the site by the Contractor at his own expense and disposed of in accordance with the Contract Documents unless otherwise permitted herein. In the event the Contractor chooses to utilize local private lots to dispose of excess material, the Contractor must provide the Engineer with written permission from the lot owner prior to utilizing the lot. Placing material suitable for fill on vacant lots will require a Grading Permit in advance of placing the material.

## **22.0 REFERENCE STANDARD SPECIFICATIONS**

Where standard specifications or testing methods have been referred to, such as ASTM or AASHTO, the intent is to refer to the latest applicable issue or revision of such specifications or testing methods. The following abbreviations are used in these specifications.

AWWA            American Waterworks Association

AASHTO        American Association of State Highway and Transportation Officials

ACI             American Concrete Institute

AI	Asphalt Institute
AISI	American Iron and Steel Institute
ANSI	American National Standards Institute (formerly the USA Standards Institute)
ASTM	American Society for Testing and Materials
NSF	National Sanitation Foundation
S.P.W.C.	Standard Specifications for Public Works Construction. (Wherever written herein shall mean "Maricopa Association of Governments, Arizona Specification for Public Works Construction".) The "Sample Forms" and "Part 100 – General Conditions" of these Standard Specifications for Public Works Construction are excluded from the documents for this project.

### **23.0 CODES, ORDINANCES AND LOCAL SPECIFICATIONS**

All work under this project shall be performed in strict accordance with these specifications and the Standard Specifications for Public Works Construction (SPWC). Where any conflict occurs between these plans and specifications and the local codes and ordinances in effect at the time, such codes and ordinances shall take precedence over these plans and specifications only if these plans and specifications are inferior as to materials and workmanship called for by such codes and ordinances.

### **24.0 INTERFERING STRUCTURES AND UTILITIES**

The Contractor shall notify Blue Stake (1-800-782-5348) at least three (3) working days prior to any excavations.

The Contractor shall exercise all possible caution to prevent damage to existing structures and utilities, whether above ground or underground. The Contractor shall notify all utility offices concerned at least seventy-two (72) hours in advance of construction operations in which a utility's facilities may be involved.

Any structure or utility damage caused by the work shall be repaired or replaced in a condition equal to or better than the condition prior to the damage. Such repair or replacement shall be accomplished at the Contractor's expense without additional compensation from the Owner.

If interfering structures or installations such as vaults, manholes, valves, utility poles, guy wires, or anchors are encountered, the Contractor shall notify the Engineer and contact the appropriate utility or structure owner at least seven (7) days in advance of construction to arrange for protection or relocation of the structure.

The Contractor shall remove, protect and/or replace all existing structures, utilities or other improvements and similar items within the proposed improvements at his own expense without additional compensation from the Owner unless specifically provided for as a pay item of work by

the Specifications or as otherwise provided for on the Plans. Replacement shall be in a manner and in a condition at least equivalent to, or better than, the original condition.

If the Contractor encounters existing facilities which will prevent the construction of any facility and which are not properly shown on the Plans, he shall notify the Owner before continuing with the construction in order that the Owner may make such field revisions as necessary to avoid conflict with the existing structure. The cost of waiting or "down" time during such field revision shall be borne by the Contractor without additional cost to the Owner. If the Contractor fails to notify the Owner when an existing structure is encountered, but proceeds with the construction despite this interference, he does so at his own risk. In particular, when the location of the new construction will prohibit the restoration of existing structures to their original condition; the Contractor shall notify the Engineer and contact the utility or structure owner so a field relocation may be made if possible to avoid the conflict.

In the event of interruption to any utility service as a result of accidental breakage or as a result of being exposed or unsupported, the Contractor shall promptly notify the proper authority. He shall cooperate with the said authority in restoration of service as promptly as possible and shall bear all costs of repair. In no case shall interruption of any utility service be allowed to exist outside working hours unless prior approval of the Owner is received.

Neither the Owner nor its officers or agents shall be responsible for damages to the Contractor as a result of the locations of the water and sewer lines or utilities being other than those shown on the Plans or for the existence of water, sewer lines or utilities not shown on the Plans.

## **25.0 AIR QUALITY - OPERATING PERMITS**

The Contractor may be required to obtain registration certificates and/or operating permits for sources of air pollution.

Information concerning these certificates and permits may be obtained from:

The Office of Air Quality  
Arizona Department of Environmental Quality  
P.O. Box 600  
Phoenix, AZ 85001-0600  
(602) 207-2300

## **26.0 ADJUST UTILITIES TO FINISHED GRADE**

The Contractor shall be responsible for locating all manhole rims, valve boxes, meter boxes, utility vaults, etc., and setting them to finished grade. The Contractor shall adjust sewer and water facilities to finished grade in accordance with the specifications within seven (7) days after street surfacing has been completed on each street. All valves and/or manholes will be made visible and accessible for emergency use within 24 hours. It shall be the responsibility of the Contractor to coordinate with the various private utility companies so that they can adjust their facilities to finished grade at an appropriate time. Adjust all facilities in accordance with these specifications and the MAG Standard Details, as modified by Lake Havasu City.

## **27.0 SAFETY, HEALTH AND SANITATION PROVISIONS**

The Contractor shall provide and maintain in a neat, sanitary condition such accommodations for the use of his employees as may be necessary to comply with the requirements and regulations of the Arizona State Department of Health.

The Contractor shall provide all safeguards, safety devices and protective equipment and take any other needed actions, on his own responsibility or as the Owner may determine, reasonably necessary to protect the life and health of employees on the job, the safety of the public and to protect property in connection with the performance of the work covered by the contract.

Precaution shall be exercised by the Contractor at all times for the protection of persons (including employees) and property. The Contractor shall comply with the provisions of all applicable laws, pertaining to such protection including all Federal and State occupational safety and health acts, and standards and regulations promulgated thereunder.

## **28.0 PUBLIC SAFETY AND TRAFFIC CONTROL**

Every attempt shall be made to provide public safety during the construction of the project. Traffic control shall be performed in accordance with Section 2650, Traffic Control, of the Technical Specifications.

During all construction operations, the Contractor shall construct and maintain such facilities as may be required to provide access for all property owners to their property. No person shall be cut off from access to his residence or place of business for a period exceeding two (2) hours, unless the Contractor has made a special arrangement with the affected persons. It shall be the Contractor's responsibility to notify all adjacent property owners of the construction activity and the schedule of such activities.

The CONTRACTOR shall submit for approval a traffic control and barricade plan within ten (10) days of receipt of Notification of Award of Contract. There shall be no deviations from the approved barricade plan unless a revised barricade plan is submitted and approved. The CONTRACTOR shall issue a news release once a week for duration of the project. The release will be published in Sunday's newspaper and shall indicate the area in which the CONTRACTOR will be performing work for that week.

Businesses must be notified forty-eight (48) hours prior to any restrictions on normal parking areas used by their employees or patrons.

The CONTRACTOR shall contact, cooperate with, and give notice to each resident, homeowner, business or school that will be affected by any part of the construction process, particularly concerning temporary interruptions to vehicular access.

Written notice of the approximate schedule and explanation of work shall be given to each resident, homeowner, business or school at least five (5) days prior to commencement of work in the area. Verbal door-to-door communication shall be made at least twenty-four (24) hours prior to construction to remind all affected parties of the construction to take place.

The OWNER shall receive a copy of all notifications to residents. In the event of complaints by residents, the OWNER may require the CONTRACTOR to provide documentation (ie. check list) showing the date & time of the verbal door-to-door communication.

In addition, the CONTRACTOR is responsible to answer and resolve any conflicts that may arise between a homeowner or business owner and himself during the construction process.

The CONTRACTOR shall provide and station competent flaggers whose sole purpose shall be to direct the movement of public traffic through or around the work. Proper advanced warning signs shall be in place when flaggers are working and removed when work requiring flaggers is completed. Flaggers must be used to assist trucks for safe ingress and egress whenever truck movements may interfere with safe passage through the work zone.

All traffic control devices that are not in use or will not be used for a period greater than 72 hours or that are determined by the Engineer to be unnecessary, confusing, or causing an unsafe condition, shall be removed by the CONTRACTOR from the public right-of-way immediately upon notification by the Engineer.

Every attempt shall be made to provide public safety during the construction of the project. Traffic control shall be performed in accordance with Section 2650, Traffic Control, of the Technical Specifications. No person shall be cut off from access to his residence or place of business for a period exceeding six (6) hours, unless the Contractor has made a special arrangement with the affected persons. In addition, no work will be scheduled which will interrupt regular trash pickup to either residential or commercial properties. It will be the CONTRACTOR'S responsibility to coordinate his activities with the local trash haulers.

No streets, avenues, boulevards or cul-de-sacs will be closed to traffic unless prior arrangements have been made and approval has been obtained from the ENGINEER.

## **29.0 TEMPORARY FACILITIES ON SITE**

### **A. General**

Except as otherwise provided, the Owner shall bear no costs of temporary facilities and their removal.

### **B. Temporary Utility Services**

The Contractor shall provide temporary electric power as necessary for the execution of the Work, including that required by all Subcontractors. He shall make the necessary arrangements with Owner, shall bear all costs for these temporary services and shall furnish and install all necessary transformers, metering facilities and distribution centers from branch circuits as he may require.

The Contractor shall provide lighting and outlets in temporary structures throughout the project as may be required for safety, proper performance and inspection of the Work. If operations are performed during hours of darkness, or if natural lighting is deemed

insufficient by Owner, the Contractor shall provide adequate floodlights, clusters and spot illumination. The use of permanently installed lighting fixtures, lamps and tubes for work will not be permitted except by special permission of Owner. The Contractor shall make arrangements with Subcontractors for electrical services and lighting as may be necessary in the performance of their work.

Temporary water service lines, if required, shall be installed and removed by the Contractor, who shall pay all charges for making the connections, running the temporary lines, removing the temporary lines at the completion of the Work and disconnecting the services. All relocations required to clear the work of others shall be performed by the Contractor when requested by the Owner.

**C. Temporary Structures**

Prior to starting Work, the Contractor shall, as directed by Owner, provide and maintain suitable temporary office facilities for the duration of the Project as required for the Contractor's project administration; and all necessary sheds and facilities for the proper storage of tools, materials and equipment employed in the performance of the Work.

**D. Toilet Facilities**

The Contractor shall provide and maintain temporary toilet facilities for the duration of operations, which shall be maintained in a clean and sanitary condition acceptable to Owner and in full compliance with applicable regulations of any public authority.

**E. Telephones**

The Contractor shall provide, maintain and pay for telephone services for the duration of the Work as required for the Contractor's operation.

**F. Fence and Barricades**

The Contractor shall provide such protective fences and barricades as he may deem necessary for public safety and to protect his storage areas and the Work in place. The location and appearance of all fences shall be subject to the approval of the Owner.

**G. Contractor Parking**

The Contractor shall not park his equipment, nor allow his personnel to park, in any area except those specifically designated by the Owner.

**H. Temporary Living Quarters**

Temporary living quarters shall not be allowed on the job site or on publicly owned properties. In addition, all Lake Havasu City Zoning Codes for the area in question shall be strictly adhered to.

I. Removal of Temporary Construction

The Contractor shall remove temporary office facilities, toilets, storage sheds and other temporary construction from the site as soon as, in Owner's opinion, the progress of Work permits. He shall recondition and restore those portions of the site occupied by the same to a condition equal to or better than it was prior to construction.

**30.0 ACCESS TO WASHES**

- A. Unless otherwise mentioned herein, the Contractor must obtain written permission from the Owner prior to gaining access or utilizing washes or City parcels for any purpose. Request for access to washes and City parcels will be reviewed on a case by case basis. The Contractor shall have access to washes and City parcels via public streets and/or private easements only. For the purposes of this paragraph, "private easement" means an ContractContractContract by and between the Contractor and a property owner, in writing, authorizing the Contractor to travel across the property owner's real property in order to have ingress or egress to washes, parcels or any portion thereof. Such ContractContractContracts, if any, shall be filed with the Office of the City Engineer before the Contractor may exercise the rights thereunder granted. Access to any wash, parcels, or portion thereof by any means not in compliance with the terms of this paragraph shall be deemed a trespass and a breach of the terms of the ContractContractContract.
- B. Violations of the provisions of subparagraph (a.) hereof, shall entitle the City to deduct the sum of One Thousand Dollars (\$1,000.00) from the monies due to Contractor as and for liquidated damages for each such violation. For the purposes of this paragraph, each entry by a vehicle upon land for which Contractor has not received permission to enter shall be deemed a separate violation of subparagraph (a.) hereof.

**31.0 COORDINATION AND COOPERATION WITH UTILITY COMPANIES AND OTHER TRADES**

A. Coordination/Interruption

The Contractor is responsible to coordinate work with all utility companies and other trades, on or affecting the job, for an efficient and effective execution of the complete project. The Contractor shall carefully examine all work that may conflict, and plan removal and/or installation details in advance of the construction to avoid any such conflict. Failure on the contractor's part to coordinate with any and all utilities, public or private, shall preclude the City's consideration for additional time or cost.

B. Permission Required

Utility mains and utility service to buildings shall not be cut off or otherwise interrupted without the Contractor obtaining permission from the Owner in each and every instance.

C. Scheduling of Interruptions

Where utilities serve facilities or buildings in use, interruptions in service shall be scheduled

during the hours when the facility is not in operation. Any overtime costs occasioned thereby shall be regarded as incidental to, and included within, the Contract Sum.

**D. General Requirements**

Prior to interrupting any utility service, the Contractor shall ascertain that he has the proper materials, together with adequate workmen and equipment, to complete the Work with a minimum of delay.

**E. Project Electrical Service**

The Contractor is responsible to coordinate with Unisource, Electric Division, to determine the extent of work to be performed by Unisource and by the Contractor to provide electric service for the finished product. The Contractor is also responsible to contact Unisource to determine the hardware required by Unisource to provide service to the final product. Unisource does not provide service to delta connections.

## SECTION 01210

### MEASUREMENT AND PAYMENT

#### PART 1 - GENERAL

##### **1.1 Description**

The outline of measurement and payment in this section is intended to provide a general guideline to the Contractor in preparing bids and submitting pay requests. Listing of work included in each bid item is not intended to include all work, but is to provide general guidance to the Contractor for allocating costs. All work will be paid for on a unit price basis with payment made for the quantity of each item completed.

All materials required for construction shall be furnished by the Contractor unless specifically stated. Items not specifically measured and paid for shall be considered as subsidiary items required to complete the installation in accordance with the intent of the contract documents. The Contractor shall include in the unit price bid items, all costs associated with subsidiary items not being measured for payment.

##### **1.2 Authority**

Measurement methods delineated in the individual specification sections complement the criteria of this section. In the event of conflict, the requirements of the individual specification section govern.

Take all measurements and compute quantities. The Engineer will verify measurements and quantities.

##### **1.3 Unit Quantities**

Quantities indicated in the Bid Form are for bidding and contract purpose only. Quantities and measurements supplied or placed in the Work and verified by the Engineer shall determine payment.

If the actual Work requires more or fewer quantities than indicated, provide the required quantities at the unit prices contracted.

## **PART 2 – UNITS AND METHODS OF MEASUREMENT**

### **2.1 General**

All items that are included in the bid for measurement and payment are included herein. All other items of work shall be considered subsidiary to construction and will not be measured for payment.

### **2.2 Units and Methods of Measurement**

#### **2.2.1 Mobilization, Bonds, and Insurance**

The Contract Lump Sum Price for this item shall constitute full compensation for furnishing all materials, labor, equipment and tools for all required bonds, insurance, mobilization of staff and equipment, and any other costs associated with complying with the contract administrative requirements and commencing work at the project site. This item also includes all work and materials necessary to complete the work as described in the plans and specifications. **Payment for this item shall be lump sum and shall not be requested until at least thirty days from the notice to proceed has elapsed.**

Payment for this item shall be made in accordance with Table A.

TABLE A

Payment for Mobilization on First Partial Payment	Not to exceed 2.5% of the Lump Sum Base Bid
Subsequent payments for Mobilization	Not to exceed 2.5% of the Lump Sum Base Bid
Payment For Mobilization on Final Partial Payment	Any remaining Mobilization in excess of 5% of the Lump Sum Base Bid

#### **2.2.2 Demolition**

The quantity of Demolition measured for payment shall be per Lump Sum.

The Contract Lump Sum Price for this item shall constitute full compensation for furnishing all materials, labor, equipment and tools for the removal and disposal of items shown on the plans. This item also includes all work and materials necessary to complete the work as described in the Plans and Specifications.

### **2.2.3 Entry Room Improvements**

The quantity of Entry Room Improvements measured for payment shall be per Lump Sum.

The Contract Lump Sum Price for this item shall constitute full compensation for furnishing all materials, labor, equipment and tools for the installation of items shown on the plans. Including, but not limited to the raised floor, stairs, handrail, data drop closet, door. This item also includes all work and materials necessary to complete the work as described in the Plans and Specifications.

### **2.2.4 Disconnect Switch 200A**

The quantity of Disconnect Switch 200A measured for payment shall be per Each installed.

The Contract Unit Price bid for this item shall constitute full compensation for the furnishing of all materials, labor, equipment and tools for the complete installation of the disconnect switch 200A and as indicated on the plan. This item also includes all work and materials necessary to complete the work as described in the Plans and Specifications.

### **2.2.5 Disconnect Switch 60A**

The quantity of Disconnect Switch 60A measured for payment shall be per Each installed.

The Contract Unit Price bid for this item shall constitute full compensation for the furnishing of all materials, labor, equipment and tools for the complete installation of the disconnect switch 60A and as indicated on the plan. This item also includes all work and materials necessary to complete the work as described in the Plans and Specifications.

### **2.2.6 Wireway Gutter 8"x8" x 6'**

The quantity of Wireway Gutter 8"x8"x6' measured for payment shall be per Each installed.

The Contract Unit Price bid for this item shall constitute full compensation for the furnishing of all materials, labor, equipment and tools for the complete installation of the wireway gutter 8"x8"x6' and as indicated on the plan. This item also includes all work and materials necessary to complete the work as described in the Plans and Specifications.

### **2.2.7 Cable Tray 24" Wide, 6" Deep**

The quantity of Cable Tray 24" Wide 6" Deep, measured for payment shall be per Foot installed.

The Contract Unit Price bid for this item shall constitute full compensation for the furnishing of all materials, labor, equipment and tools for the complete installation of the cable tray 24" wide, 6" deep and as indicated on the plan. This item also includes all work and materials necessary to complete the work as described in the Plans and Specifications.

### **2.2.8 Light Fixtures 2x4 LED**

The quantity of Light Fixtures 2x4 LED measured for payment shall be per Each installed.

The Contract Unit Price bid for this item shall constitute full compensation for the furnishing of all materials, labor, equipment and tools for the complete installation of the cable tray 24" wide, 6" deep light fixtures 2x4 LED and as indicated on the plan. This item also includes all work and materials necessary to complete the work as described in the Plans and Specifications.

### **2.2.9 IT Racks 24" Wide, 76" Tall**

The quantity of IT Racks 24" Wide, 76" Tall measured for payment shall be per Each installed.

The Contract Unit Price bid for this item shall constitute full compensation for the furnishing of all materials, labor, equipment and tools for the complete installation of (5) new IT Racks 24" wide, 76" tall and the re-use of (6) existing racks and as indicated on the plan. This item also includes all work and materials necessary to complete the work as described in the Plans and Specifications.

### **2.2.10 Electrical**

The quantity of Electrical measured for payment shall be per Lump Sum installed.

The Contract Unit Price bid for this item shall constitute full compensation for the furnishing of all materials, labor, equipment and tools for the complete installation of conduit, wire, panelboards, receptacles, circuit

breakers as indicated on the plan. This item also includes all work and materials necessary to complete the work as described in the Plans and Specifications.

### **2.2.11 Emergency Stop Switch**

The quantity of Emergency Stop Switch measured for payment shall be per Each installed.

The Contract Unit Price bid for this item shall constitute full compensation for the furnishing of all materials, labor, equipment and tools for the complete installation of emergency stop switch, label and as indicated on the plan. This item also includes all work and materials necessary to complete the work as described in the Plans and Specifications.

### **2.2.12 Hard Ceiling**

The quantity of Hard Ceiling measured for payment shall be per Square Foot installed.

The Contract Unit Price bid for this item shall constitute full compensation for the furnishing of all materials, labor, equipment and tools for the complete installation of hard ceiling, furring channels, 5/8" gypsum board silicone sealant as indicated on the plan. This item also includes all work and materials necessary to complete the work as described in the Plans and Specifications.

### **2.2.13 Raised Floor System**

The quantity of Raised Floor measured for payment shall be per Square Foot installed.

The Contract Unit Price bid for this item shall constitute full compensation for the furnishing of all materials, labor, equipment and tools for the complete installation of raised floor system as indicated on the plan. This item also includes all work and materials necessary to complete the work as described in the Plans and Specifications.

### **2.2.14 Mechanical**

The quantity of Mechanical measured for payment shall be per Lump Sum installed.

The Contract Unit Price bid for this item shall constitute full compensation for the furnishing of all materials, labor, equipment and tools for the complete installation of mechanical system as indicated on the plan. The

HVAC Units are a separate item. This item also includes all work and materials necessary to complete the work as described in the Plans and Specifications.

#### **2.2.15 HVAC Units**

The quantity of HVAC Units measured for payment shall be per Each installed.

The Contract Unit Price bid for this item shall constitute full compensation for the furnishing of all materials, labor, equipment and tools for the complete installation of HVAC units per specifications and as indicated on the plan. This item also includes all work and materials necessary to complete the work as described in the Plans and Specifications.

#### **2.2.16 Fire Suppression System**

The quantity of Fire Suppression System measured for payment shall be per Lump Sum installed.

The Contract Unit Price bid for this item shall constitute full compensation for the furnishing of all materials, labor, equipment and tools for the complete installation of fire protection per specifications and as indicated on the plan. This item also includes all work and materials necessary to complete the work as described in the Plans and Specifications and shall meet Lake Havasu City Fire Department standards.

#### **2.2.17 Force Account**

A force account has been established and is indicated in the Bid Form as a lump sum cost item. The value indicated in the Bid Form is to be included in the total bid price for the work. The Contractor shall not consider any monies indicated in the force account item as a part of his payment for the Work or profit or otherwise without written notification by the Owner.

**\*\*END OF SECTION 01210\*\***

## SECTION 02050

### DEMOLITION

#### PART 1 GENERAL

##### 1.01 SUMMARY

- A. Section Includes: Demolition necessary or required so that the new construction, alterations, remodeling and related work can be performed and completed in accordance with the Contract Documents.

##### 1.02 SUBMITTALS

- A. Submit the following in accordance with Section 01300:
  - 1. Copies of permits and notices authorizing building demolition as may be required by law, including permits to transport and dispose of debris.
- B. Submit project record documents which accurately record actual locations of capped utilities, and concealed obstructions in accordance with Section 01700.

##### 1.03 QUALITY ASSURANCE

- A. Demolition Firm Qualifications:
  - 1. Specializing in performing the Work required by this Section.
  - 2. Minimum 5 years documented experience.
  - 3. Utilizing workers experienced in disconnecting and capping utilities, if applicable.
- B. Regulatory Requirements
  - 1. Conform to applicable code for demolition of structures, safety of adjacent structures, dust control, and disposal.
  - 2. Obtain required permits from authorities.
  - 3. Conform to applicable regulatory procedures if hazardous or contaminated materials are discovered.

##### 1.04 PROJECT CONDITIONS

- A. The existing building shall remain in use around the scope of work as described in the plans. The General Contractor shall make efforts to not disrupt work adjacent to the tenant improvement.
- B. The Contractor for this project shall coordinate work activities with the Owner in those locations where dust must be controlled. See Section 1500- Construction Facilities and Temporary Controls

#### PART 2 PRODUCTS

##### 2.01 MATERIALS

- A. Carefully remove materials that are scheduled for reuse, and protect same.
- B. Unless specifically scheduled for reuse, demolished materials shall become the possession of the Contractor and shall be immediately removed from the site
- C. Carefully remove in whole or part as required, store and protect for reinstallation the materials **as indicated on the drawings.**

#### PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Verify existing conditions and notify the Architect in writing of discrepancies before proceeding with the work.

### 3.02 PREPARATION

- A. Notify affected utility companies before starting work and comply with their requirements.
- B. Provide, erect, and maintain temporary barriers and security devices where required and as indicated on drawings.
- C. Utilities:
  - 1. Mark location of utilities.
  - 2. Identify, disconnect, remove and cap designated utilities within demolition areas as required.
- D. Protection of existing building exterior:
  - 1. Protect walkways from damage which may be caused by movement of construction materials.
  - 2. Protect from weather openings created by temporary mechanical equipment or where existing roofing is removed to set such equipment. Do not allow temporary ductwork to leave dirt or markings on face of exterior stucco.
  - 3. Install temporary deck of exterior grade plywood and wood skids, or other approved material, for material and personnel traffic over existing roofing, to protect existing roof and surrounding surfaces from damage. Repair damage caused to the roof and other items.
- E. Dustproof Partitions:
  - 1. Erect and maintain as required to prevent spread of dust, fumes and smoke to other parts of the building.
  - 2. Design of temporary partitions shall be acceptable to the Architect. See construction documents for layout of dust proof partitions.
  - 3. On completion, remove partitions and repair damage surfaces to match adjacent surfaces.

### 3.03 GENERAL DEMOLITION

- A. Carry out demolition work to cause as little inconvenience to any adjacent occupied building areas as possible and with minimum interference to public or private accesses. Maintain protected egress and access at all times.
- B. Perform the removal, cutting, drilling, etc., of existing work with extreme care, and using small tools in order not to jeopardize the structural integrity of the building.
- C. Safety shore existing construction whenever existing supports are removed to allow the installation of new work.
- D. Rebuild existing work which must be removed to allow the installation of new work as indicated on the Drawings.
- E. Perform cutting of existing concrete and masonry with saws and core drills. Do not use jack-hammers except where permitted by Architect.

- H. Material Disposal:
1. Remove materials from site and dispose of in a legal manner at no additional expense to Owner.
  2. No materials are to be sold on, or adjacent to, the site. Signs advertising the sale of materials shall not be allowed.
  3. Burning of materials on site is not permitted.
  4. Break concrete and masonry into sections less than 3 feet in any dimension.
  5. Remove from site, contaminated, vermin infested, or dangerous materials encountered and dispose of by safe means so as not to endanger health of workers and public.
  6. Debris from the demolition shall not be allowed to accumulate within the building or on the site.

#### 3.04 SELECTIVE INTERIOR DEMOLITION

- A. Selectively demolish and remove items and materials from the interior of buildings as indicated.
- B. Items, materials or portions of the interior of the buildings that are designated to remain intact shall be protected and carefully worked around during the demolition work.

#### 3.05 STRUCTURE DEMOLITION

- A. Begin demolition at top of building and proceed to lowest basement floor, without using explosives.
- B. Demolish structure above each floor level without damaging supporting members on lower levels.

END OF SECTION

## SECTION 05410

### LOAD-BEARING METAL STUD SYSTEM

#### PART 1 GENERAL

##### 1.01 SUMMARY

- A. Section Includes: Load-bearing metal stud system for interior framing and load-bearing and non-load bearing exterior framing as shown on Drawings and as specified.

##### 1.02 SYSTEM DESCRIPTION

- A. Design Requirements: Design structural members in accordance with AISI "Specification for the Design of Cold-formed Structural Steel."
  - 1. Maximum allowable deflection:
    - a. Walls receiving gypsum wallboard finishes: L/120.
    - b. Walls receiving plaster and brittle finishes, including EIFS and stucco: L/240.
    - c. Walls receiving ceramic tile finishes: L/360.
    - d. Walls receiving brick veneer: L/600.
  - 2. Design system to provide for movement of components without damage, failure of joint seals, undue stress on fasteners, or other detrimental effects when subject to seasonal or cyclic day/night temperature ranges.
  - 3. Design system to accommodate construction tolerances, deflection of building structural members, and clearances of intended openings.

##### 1.03 SUBMITTALS

- A. Product Data: Submit Manufacturer's Specifications, design data and installation instructions.
- B. Shop Drawings: Submit Drawings showing layout, dimensions and construction details.
- C. Certificates:
  - 1. Submit Mill Certification with shipment to verify chemical composition, yield strength, tensile strength, elongation and coating thickness. Include listing of applicable ASTM standards specified in this section and comparison of ASTM requirements to actual materials provided to jobsite.
  - 2. Submit Manufacturer's certification that products furnished meet or exceed the specified design requirements.

##### 1.04 QUALITY ASSURANCE

- A. Welding: Performed by certified welders in compliance with AWS D1.3 Structural Welding Code Sheet Steel.
- B. Regulatory Requirements: Manufacturers shall have current ICBO or CABO evaluation report.

##### 1.05 DELIVERY, STORAGE AND HANDLING

- A. Exercise care during unloading, storage and erection to avoid damage. Dumping on the ground is not permitted.
- B. Support material stored at the site completely free of the ground, and cover to avoid damage from the elements.

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Furnish products of one of the following Manufacturers, except as approved by the Architect, subject to compliance with Specification requirements:
  - 1. American Studco, Inc.
  - 2. Gold Bond Building Products Div., National Gypsum.
  - 3. Unimast, Inc.
  - 4. Western
  - 5. CEMCO
  - 6. Dietrich Industries
  - 7. Manufacturing members of the Metal Stud Manufacturer's Association, Corvallis, Oregon, (503) 757-8991

### **2.02 MATERIALS**

- A. Studs, Track, Bracing and Bridging: Conform to ASTM C955.
  - 1. ASTM A653, G60 hot-dip galvanized coating.
  - 2. Minimum structural properties: In accordance with General Structural Notes.
- C. Track: Channel shaped; same width as studs, for tight fit; 16 gage solid web, galvanized or painted to match studs.
- D. Bracing, Furring, Bridging: Formed galvanized sheet steel; channel shaped. Provide CRC - 1-1/2 inch x 16 gage (38mm x 1.2mm) bridging.
- E. Plates, Gussets, Clips: Galvanized formed steel, thickness determined for conditions encountered, Manufacturer's standard shapes.
- F. Fasteners and Attachments:
  - 1. Sheet metal: Self-drilling self-tapping screws, type appropriate for attachment detail requirements with penetration through joined materials not less than 3 exposed threads.
  - 2. Anchorage devices to structural components: Power driven or powder actuated, drilled expansion bolts, or screws, with sleeves.

### **2.03 FABRICATION**

- A. Fabricate assemblies of framed sections of sizes and profiles required, with framing members fitted, reinforced and braced to suit design requirements.
- B. Fit and assemble in largest practical sections for delivery to site, ready for installation.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verification of Conditions: Examine subsurfaces to receive Work and report detrimental conditions in writing to Architect. Commencement of Work will be construed as acceptance of subsurfaces.
- B. Coordination: Coordinate with other Work which affects, connects with, or will be concealed by this Work.

### **3.02 ERECTION**

- A. Install components in accordance with Manufacturer's instructions.
- B. Align floor and ceiling tracks; locate to wall and partition layout. Secure in place with fasteners or welding at maximum 24 inches (600mm). Coordinate installation of sealant with floor and ceiling tracks.

- C. Place studs at 16 [24] inches (400mm) (600mm) o.c.; not more than 2 inches (50mm) from abutting walls and at each side of openings. Connect studs to tracks using fastener method unless noted otherwise.
- D. Construct corners using minimum three studs. Double stud at wall opening, door and window jambs.
- E. Erect load bearing studs one piece full length. Splicing of studs is not permitted.
- F. Erect load bearing studs, brace and reinforce to develop full strength to meet design requirements.
- G. Extend stud framing through ceiling to underside of floor or roof structure above.
- H. Coordinate placement of insulation in multiple stud spaces made inaccessible after erection.
- I. Install intermediate studs above and below openings to match wall stud spacing.
- J. Provide deflection allowance in stud track, directly below horizontal building framing for non-load bearing framing.
- K. Attach cross studs or furring channels to studs for attachment of fixtures anchored to walls.
- L. Install framing between studs for attachment of mechanical and electrical items, and to prevent stud rotation.
- M. Touch-up field welds and damaged galvanized surfaces with primer.

### 3.03 FIELD QUALITY CONTROL

- A. Testing: At Owner's request, Contractor shall provide spot testing of actual properties of steel framing to verify compliance with specifications.

### 3.04 CLEANING

- A. During the course of the Work and on completion, remove and dispose of excess materials, equipment and debris away from premises. Leave Work in clean condition in accordance with Section 01500.

END OF SECTION

**SECTION 05500**  
**METAL FABRICATIONS**

**PART 1        GENERAL**

1.01    SUMMARY

- A.     Section Includes: Miscellaneous metal as shown on Drawings and as specified, including items fabricated from iron and steel shapes, plates, bars, strips, tubes, pipes and castings which are not a part of structural steel or other metal systems in other Sections of these Specifications. Types of miscellaneous metal items include, but are not limited to, the following:
1.     Miscellaneous framing and supports.
  2.     Miscellaneous steel trim.
  3.     Stair nosings.
  4.     Other items as indicated.

1.02    SUBMITTALS

- A.     Shop Drawings: Submit Drawings for the fabrication and erection of assemblies of items which are not completely shown by the Manufacturer's data sheets.
1.     Include plans and elevations at not less than 1 inch to 1'-0" (25mm to 300mm) scale, and include details of sections and connections at not less than 3 inches to 1'-0" (75mm to 300mm) scale.
  2.     Show anchorage and accessory items.

1.03    QUALITY ASSURANCE

- A.     Standards: Comply with the following, except as otherwise shown and specified:
1.     AISC "Specifications for the Design, Fabrication and Erection of Structural Steel for Buildings."
  2.     AISI "Specifications for the Design of Cold-Formed Steel Structural Members."
  3.     AWS "Structural Welding Code-Steel."
  4.     ASTM A6 "General Requirements for Rolled Steel Plates Shapes, Sheet Piping and Bars for Structural Use."
- B.     Qualifications: Qualify welding processes and welding operators in accordance with AWS "Standard Qualification Procedure."

1.04    DELIVERY, STORAGE AND HANDLING

- A.     Exercise care during unloading, storage and erection to avoid damage. Dumping on the ground is not permitted.
- B.     Support material stored at the site completely free of the ground, and cover to avoid damage from the elements.

## 1.05 PROJECT/SITE CONDITIONS

- A. Field Measurements: Take field measurements prior to preparation of Shop Drawings and fabrication, where possible, to ensure proper fitting of the Work. Allow for trimming and fitting wherever the taking of field measurements before fabrication might delay the Work.

## PART 2 PRODUCTS

### 2.01 MATERIALS

- A. Steel Plates, Shapes and Bars: ASTM A36.
- B. Steel Bars and Bar-size Shapes: ASTM A36.
- C. Steel Tubing (Not-formed, Welded or Seamless): ASTM A500, Grade B (Fy = 46,000 psi) (317MPa).
- D. Cold-Finished Carbon Steel Bars: ASTM A108, Grade as selected by fabricator.
- E. Hot-rolled Carbon Steel Sheets and Strips: ASTM A568 and ASTM A569, pickled and oiled.
- F. Cold-rolled Carbon Steel Sheets: ASTM A611.
- G. Hot-dip Galvanized Steel Sheets: ASTM A653, with G90 zinc coating.
- H. Cold-drawn Steel Tubing: ASTM A512, sunk drawn, butt welded, cold-finished and stress-relieved.
- J. Anchors:
  - 1. Masonry Anchorage Devices: Expansion shield, FS FF-S-325.
  - 2. Toggle bolts: Tumble-wing type, FS FF-B-588; type, class and style as required.
  - 3. Threaded-type concrete inserts: Galvanized ferrous castings, internally threaded to receive 3/4 inch (19mm) diameter machine bolts; either malleable iron complying with ASTM A47 or cast steel complying with ASTM A27; hot-dip galvanized in compliance with ASTM A153.
  - 4. Wedge-type concrete inserts: Galvanized box-type ferrous castings, designed to accept 3/4 inch (19mm) diameter bolts having special wedge-shaped heads, either malleable iron complying with ASTM A47 or cast steel complying with ASTM A27; hot-dip galvanized in compliance with ASTM A153.
  - 5. Provide carbon steel bolts having special wedge-shaped heads, nuts washers and shims; all galvanized in compliance with ASTM A153.
  - 6. Slotted-type concrete inserts: Galvanized 1/8 inch (3mm) thick pressed steel plate complying with ASTM A283. Box-type welded construction with slot designed to receive 3/4 inch (19mm) diameter square head bolt and with knockout cover. Hot-dip galvanized in compliance with ASTM A123.
- K. Fasteners: Provide zinc-coated fasteners with galvanizing complying with ASTM A153 for exterior use or where built into exterior walls. Select fasteners for the type, grade and class required for the installation of miscellaneous metal items.
  - 1. Bolts and nuts: ASTM A307, Grade A, regular hexagon head.
  - 2. Bolts, hexagon and square: ANSI B-18.2.1.
  - 3. Bolts, round head: ANSI B-18.5.
  - 4. Lag bolts: Square head type.
  - 5. Wood screws: ANSI B-18.6.1, flat head carbon steel.
  - 6. Plain washers: ASTM F844 helical spring type carbon steel.
- M. Stair Nosings: Wooster Products WP-4J; Type 6063-T5 extruded aluminum with anti-slip filler. Color: Black.
- N. Galvanizing: ASTM A123 for steel plates, bars and strips.
- O. Paint:

1. Metal Primer: VOC compliant.
  - a. Interior Steel: Tnemec 10-99W (white).
  - a. Interior Steel: Zinc alkyd, high-solids primer, conforming to FS TT-P-645b.
  - b. Exterior Steel (exposed): Tnemec-Zinc 90-97.
  - b. Exterior Steel (exposed): 2-component, moisture-cured zinc-rich primer conforming to SSPC-PS12.01.
2. Galvanizing repair paint: High zinc dust content; MIL-P-21035 (Ships).

## 2.02 ACCESSORIES

- A. Inserts and Anchorages: Furnish inserts and anchoring devices to be set in concrete or built into masonry for installation of Miscellaneous Metal Work. Provide setting Drawings, templates, instructions and directions for installation of anchorage devices.

## 2.03 FABRICATION

- A. General: For fabrication of Miscellaneous Metal Work which will be exposed to view, use only materials which are smooth and free of surface blemishes including pitting, seam marks, roller marks, rolled trade names and roughness. Remove such blemishes by grinding or by welding and grinding, prior to cleaning, treating and application of surface finishes, including zinc coatings.
- B. Shop Assembly: Preassemble items in shop, when possible, to minimize field splicing and assembly of units at the site. Disassemble units only to extent necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.
- C. Workmanship:
  1. Use materials of the size and thickness shown, or if not shown, of the required size and thickness to produce adequate strength and durability of the finished product for the intended use. Work to the dimensions of fabrication and support. Use type of materials shown or specified for various components of Work.
  2. Form exposed Work true to line and level with accurate angles, surfaces and straight sharp edges. Ease exposed edges to a radius of approximately 1/32 inch unless otherwise shown. Form bent-metal corners to the smallest radius possible without causing grain separation or otherwise impairing the Work.
  3. Weld corners and seam continuously and in accordance with the recommendations of AWS. Grind exposed welds smooth and flush to match and blend with adjoining surfaces.
  4. Form exposed connections with hairline joints which are flush and smooth, using concealed fasteners wherever possible. Use exposed fasteners of the type shown, or if not shown, use Phillips flat-head (countersunk) screws or bolts.
  5. Provide for anchorage of type shown, coordinated with supporting structure and the progress schedule. Fabricate as required to provide adequate support for the intended use of the Work.
  6. Cut, reinforce, drill and tap Miscellaneous Metal Work as may be required to receive finish hardware and similar items of Work.
  7. Use hot-rolled steel bars for Work fabricated from bar stock, unless Work is indicated to be fabricated from cold-rolled, or cold-finished stock.
- D. Carpenter's Iron Work:
  1. Furnish bent or otherwise custom fabricated bolts, plates, anchors, hangers, dowels and other miscellaneous steel and iron shapes as required for framing and supporting woodwork, and for anchoring or securing woodwork to concrete or other structures. Straight bolts and other stock rough hardware are specified in Division 6 Sections.
  2. Manufacture or fabricate items of sizes, shapes and dimensions required. Furnish malleable iron washers for heads and nuts which bear on wood structural connections; elsewhere, furnish steel washers.
- E. Prefabricated Aluminum Ladder:
  1. Provide Type 500 Fixed Access Ladder of type indicated on Drawings, as manufactured by O'Keefe's, Inc.
  2. Comply with requirements of ANSI A-14.3.
  3. Finish: Mill [Acrylic urethane; color as selected].

- E. Alternating Tread Stair:
  - 1. Provide "56 Degree Steel Stair" as manufactured by Lapeyre Stair.
  - 2. Finish: Carbon steel [Hot-dip galvanized].
- F. Loose Bearing Plates: Provide loose bearing plates for steel items bearing on masonry or concrete construction, made flat, free from warps or twists, and of required thickness and bearing area. Drill plates to receive anchor bolts and for grouting as required.
- G. Loose Steel Lintels: provide loose structural steel shape lintels for openings and recesses in masonry walls and partitions, as shown. Weld adjoining members together to form a single unit. Provide not less than 4 inch (100mm) bearing at each side of openings, unless otherwise shown.
- H. Miscellaneous Framing and Supports:
  - 1. Provide miscellaneous steel framing and supports which are not a part of the structural steel framework, as required to complete Work.
  - 2. Fabricate miscellaneous units to sizes, shapes and profiles shown, or if not shown, of the dimensions required to receive adjacent grating, plates, doors or other Work to be retained by the framing. Except as otherwise shown, fabricate from structural steel shapes and plates and steel bars of all welded construction using mitered corners, welded brackets and splice plates, and a minimum number of joints for field connection. Cut, drill and tap units to receive hardware and similar items to be anchored to the Work.
  - 3. Equip units with integrally welded anchor straps for casting into concrete or building into masonry wherever possible. Furnish inserts if units must be installed after concrete is poured. Except as otherwise shown, space anchors 24 inches (600mm) o.c., and provide minimum anchor units of 1-1/4 inch x 1/3 inch x 8 inch (32mm x 8mm x 200mm) steel straps.
- I. Miscellaneous Steel Trim: Provide shapes and sizes as required for the profiles shown. Except as otherwise noted, fabricate units from structural steel shapes and plates and steel bars, with continuously welded joints and smooth exposed edges. Use concealed field splices wherever possible. Provide cutouts, fittings and anchorages as required for coordination of assembly and installation with other Work.
- J. Shelf Angles: Provide structural steel shelf angles of sizes shown for attachment to concrete framing. Provide slotted holes to receive 3/4 inch (19mm) bolts, spaced not more than 6 inches (150mm) from ends and not more than 24 inches (600mm) o.c., unless otherwise shown.

## 2.04 FINISHING

- A. Galvanizing: Comply with ASTM A123 and A153 for the hot-dip process after fabrication.
- B. Shop Painting:
  - 1. Shop paint Miscellaneous Metal Work, except those members or portions of members to be embedded in concrete or masonry, surfaces and edges to be field welded, and galvanized surfaces, unless otherwise indicated.
  - 2. Remove scale, rust and other deleterious materials before shop coat of paint is applied. Clean in accordance with SSPC SP-2, SP-3, or SP-7, as required. Remove oil, grease and similar contaminants in accordance with SSPC SP-1.
  - 3. Apply one shop coat of metal primer paint to fabricated metal items, except apply 2 coats of paint to surfaces which are inaccessible after assembly or erection.
  - 4. Immediately after surface preparation, brush or spray on metal primer paint in accordance with Manufacturer's instructions, and to provide a uniform dry film thickness of 2 mils for each coat.

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Verification of Conditions: Examine subsurfaces to receive Work and report detrimental conditions in writing to Architect. Commencement of Work will be construed as acceptance of subsurfaces.
- B. Coordination: Coordinate with other Work which affects, connects with, or will be concealed by this Work.

### 3.02 PREPARATION

- A. Clean and strip primed steel items to bare metal where site welding is required.
- B. Supply items required to be cast into concrete or embedded in masonry with setting templates to appropriate Trades.

### 3.03 INSTALLATION

- A. Install items plumb and level, accurately fitted, free from distortion or defects.
- B. Allow for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
- C. Field weld components indicated on Shop Drawings.
- D. Perform field welding in accordance with AWS D1.1.
- E. Obtain Architect approval prior to site cutting or making adjustments not scheduled.
- F. After erection, prime welds, abrasions, and surfaces not shop primed and galvanized members, except surfaces to be in contact with concrete.

### 3.04 ERECTION TOLERANCES

- A. Maximum Variation from Plumb: 1/4 inch (6mm) per story, non-cumulative.
- B. Maximum Offset from True Alignment: 1/4 inch (6mm).

### 3.05 CLEANING

- A. During the course of the Work and on completion, remove and dispose of excess materials, equipment and debris away from premises. Leave Work in clean condition in accordance with Section 01500.

END OF SECTION

**SECTION 07210**  
**BUILDING INSULATION**

**PART 1 GENERAL**

1.01 SUMMARY

- A. Section Includes: Insulation as shown on Drawings and as specified.

1.02 SUBMITTALS

- A. Product Data: Submit Manufacturer's data, installation instructions, limitations and recommendations. Include certification and test data substantiating R-Values and combustibility of each type of insulation.

1.03 QUALITY ASSURANCE

- A. Regulatory Requirements: Conform to applicable code for fire resistance ratings and surface burning characteristics.
- B. Provide certificate of compliance from authority having jurisdiction indicating approval of combustibility.

1.04 DELIVERY, STORAGE AND HANDLING

- A. Delivery and Storage: Deliver materials to job in Manufacturer's original unopened packaging. Adequately protect against damage while stored at the site. Deliver so that stocks of materials on the site will permit uninterrupted progress of the Work.
- B. Materials shall be properly identified on each package with the Manufacturer's name and R value.

**PART 2 PRODUCTS**

2.01 MANUFACTURERS

- A. Furnish products of one of the following Manufacturers, except as approved by the Architect, subject to compliance with Specification requirements:
1. Batt and Blanket Insulation:
    - a. Johns-Manville
    - b. Owens-Corning Fiberglas Corp.
    - c. Certainteed
  2. Board Insulation:
    - a. The Dow Chemical Co.
    - b. Amoco Foam Products Co.
    - c. UCI
    - d. Owens Corning
- B. Materials designated for a specific application shall be the products of one Manufacturer.

2.02 MATERIALS

- A. Batt Insulation: ASTM C665, [Type III, Class A, Category 1 faced] [Type I] R-11 and R-19 glass fiber batts, with resistance values as indicated on the Drawings, for various locations. Batts shall be a single thickness to meet the required R value noted on Drawings. Multiple layers of batts will not be accepted. Furnish faced batts with nailing flanges at wood framing.
- B. Fire Safing Insulation: ASTM C24, E119 and E136. Thickness shall be as required by the Manufacturer to provide a fire rating equal to that of the assembly of which it is a part. Where smoke stop protection also is required, install Thermafiber SmokeSeal Caulking Compound as needed to meet UL Standard 1479 and ASTM E814 procedure.

C. Acoustical Batt Insulation: As specified in Section 09530.

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Examine subsurfaces to receive Work of this Section. Report in writing to General Contractor, with a copy to Architect, any conditions detrimental to Work of this Section. Failure to observe this injunction constitutes a waiver to any subsequent claims to the contrary and will make Insulation Contractor responsible for any corrections the Architect may require. Commencement of Work will be construed as acceptance of subsurfaces.

### 3.02 INSTALLATION

- A. Batt Insulation:
1. Apply no insulation until such time as the Construction has progressed to the point that inclement weather will not damage or wet the insulation material.
  2. Fully insulate small areas between closely spaced framing members, pipes, conduits or other obstruction by cutting and fitting insulation material as required to maintain the integrity of the insulation.
  3. At wood framing [nail or staple flanges of faced batts] [and] [friction fit unfaced batts] between wood members.
  4. Batt insulation at metal studs, concrete tees, and other non-nailable members shall be installed [with vapor barriers in and flanges] continuously tight against framing members.
    - a. Secure in place with string wire or other method as approved by Architect.
    - b. Insulation at concrete tees shall be installed with 5 adhesive applied pins per each 2'-0" x 4'-0" batt.
  5. End matching neatly with ends fitting snugly.
- B. Fire Safing Insulation: Install in proper sizes on safing clips as needed but not to exceed 24 inches (600mm) O.C. Leave no voids between walls and edges of slabs.
- C. Building Board Insulation:
1. Install perimeter polystyrene board insulation continuously to a depth of 2'-0" (600mm) below the exterior grade level around the perimeter of the building on the inside face to form a continuous thermal barrier from the floor slab down. Backfilling against the insulation shall ensure a snug fit.
  2. Insulate small areas between closely spaced framing members, pipe, conduit or other obstruction by cutting and fitting insulation materials as required to maintain the integrity of the insulation.
  3. Fit ends snugly or overlap.
- D. Separate Vapor Barrier/Cover Sheet:
1. Adhesive apply over exposed surfaces of insulation with joints lapped and glued.
  2. No insulation shall be left exposed.
  3. Install friction washers over pins to hold cover sheet and insulation in place.
  4. Membrane shall be closely fitted around pipes, conduits, columns, and other protrusions."

### 3.03 CLEANING

- A. During the course of the Work and on completion of the Work, remove excess materials, equipment and debris and dispose of away from premises. Leave Work in clean condition in accordance with Section 01500.
- B. Protection: Take precautions to protect insulation, both during and after installation, from damage of any kind until covered.

END OF SECTION

## SECTION 07270

### FIRESTOPPING

#### PART 1 GENERAL

##### 1.01 SUMMARY

- A. Section Includes: Firestopping as shown on Drawings and as specified.

##### 1.02 SYSTEM DESCRIPTION

- A. Provide UL Classified or Warnock Hersey Listed firestopping system to prevent the spread of fire, smoke and gasses through penetrations in fire resistive walls, floors and partitions, including; but not limited to; the following areas:
  - 1. Unprotected openings and openings accommodating penetrating items such as cables, cable trays, pipes, ducts, boxes and conduits through fire rated floors, walls and smoke barriers.
  - 2. Head of wall openings between wall and connecting floor or roof deck assemblies.
  - 3. Openings at curtainwalls between exterior walls and connecting floor slab perimeters.
- B. Firestop systems shall not be intended to support live loads and traffic unless specifically approved by Testing Agency.
- C. Firestop systems shall be approved by Code Authority.

##### 1.03 SUBMITTALS

- A. Product Data: Submit Manufacturer's Specifications, performance criteria, Drawings and instructions.
- B. Shop Drawings:
  - 1. Submit Manufacturer's complete Shop Drawings showing proposed material, reinforcement, anchorage, fastenings method of installation and UL or Warnock Hersey listing number.
  - 2. Work performed within City of Phoenix: Manufacturer shall provide detailed shop drawings which include project name, project address, installation Contractor name and address, directly from the manufacturer to the City of Phoenix Building Department at no additional cost to Owner.
- C. Test Reports: Submit UL or Warnock Hersey test report description for firestopping system.
- D. Provide certificate of compliance from authority having jurisdiction indicating approval of firestop systems.

##### 1.04 QUALITY ASSURANCE

- A. Qualifications: Applicator with minimum of 5 years experience and approved by the materials manufacturer.
- B. Regulatory Requirements: Conform to applicable code for fire resistance ratings and surface burning characteristics:
  - 1. ASTM E 136, ASTM E 119 and ASTM E 814, as applicable.
  - 2. UL 1479 fire test to achieve required fire-rating as noted on Drawings.
  - 3. Listing:
    - a. UL Fire Resistance Directory (current edition).
    - b. WH International Listings
- C. Pre-Installation Conference:

1. Convene a pre-installation conference to review specifications and procedures with the Architect, Contractor, installer, manufacturer's representative, Owner and other trades relevant to the work, prior to ordering materials.
2. Notify Architect at least 48 hours prior to starting Work.

#### 1.05 DELIVERY, STORAGE AND HANDLING

- A. Packing and Shipping: Deliver materials to site in Manufacturer's original unopened packaging with labels intact.
- B. Storage: Adequately protect against damage while stored at the site.
- C. Handling: Comply with Manufacturer's instructions.

### PART 2 PRODUCTS

#### 2.01 MANUFACTURERS

- A. Furnish firestop systems acceptable to governing Code Authority from one of the following Manufacturers, subject to compliance with Specification requirements:
  1. U.S. Gypsum Co.
  2. Johns-Manville
  3. Tremco, Inc.
  4. RectorSeal Corporation
  5. 3M Fire Protection Products
  6. Specified Technologies, Inc.

#### 2.02 MATERIALS

- A. Firestop System Materials - General:
  1. Appropriate for penetration.
  2. Include every component required for code approved installation, including; but not limited to:
    - a. Firestopping putties or compound.
    - b. Backing material.
    - c. Wrap strips.
    - d. Primers, clips and collars.
- B. Properties:
  1. Free of asbestos, halogens and volatile components after curing and shall not slump or sag, (except for self-leveling products).
  2. Capable of maintaining an effective barrier against flames, heat and smoke in compliance with the requirements of ASTM E814, UL 1479 and U.B.C. Standard 7-5.
  3. Non-combustible per ASTM E 136.
  4. UV resistant where exposed to sunlight.
  5. Water resistant where exposed to moisture.
  6. Firestop system shall accommodate movement without adversely affecting fire rating of wall/floor assembly.
  7. Shrink resistant.
  8. Paintable or capable of receiving finish materials in those areas which are exposed to view and which are scheduled to receive finishes.

### PART 3 EXECUTION

#### 3.01 EXAMINATION

- A. Verification of Conditions: Examine subsurfaces to receive Work and report detrimental conditions in writing to Architect. Commencement of Work will be construed as acceptance of subsurfaces.
- B. Coordination: Coordinate with other Work which affects, connects with, or will be concealed by this Work.

### 3.02 PREPARATION

- A. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other matter which may affect bond of firestopping material.
- B. Remove incompatible materials which affect bond.
- C. Install backing materials to arrest liquid material leakage, if required.

### 3.03 INSTALLATION

- A. Installation shall conform to requirements of qualified designs or manufacturer approved modifications as supported by engineering reports, and shall be approved and accepted by the authority having jurisdiction.
  - 1. Apply primer and firestop materials in accordance with Manufacturer's instructions and in accordance with the appropriate UL Fire Resistance Directory or with the appropriate Warnock Hersey International Listing.
  - 2. Apply firestopping material in sufficient thickness to achieve rating, to ensure against the passage of flames, smoke and toxic gases, and to a uniform density and texture.
  - 3. Protect materials from damage on surface subjected to traffic and install cover plates as required on firestop system that will or may be subject to traffic.
  - 4. Tool surfaces of firestop products to provide a smooth and clean appearance.
  - 5. Work performed within City of Phoenix: In accordance with City of Phoenix Building Code Regulation 43-B.
- B. Provide firestopping for conditions specified whether or not firestopping is indicated, and, if indicated, whether such material is designated as insulation, safing or otherwise. Insulation types specified in other sections shall not be installed in lieu of firestopping materials.
- C. Building Exterior Perimeters:
  - 1. Where exterior facing construction is continuous past a structural floor, and a space (i.e. construction joint) would otherwise remain open between the inner face of the wall construction and the outer perimeter edge of the structural floor, provide firestopping to equal the fire resistance of the floor assembly.
  - 2. Mineral wool by itself shall not constitute an acceptable firestop. If mineral wool is part of firestop system, the mineral wool shall be completely covered by appropriate thickness of UL or Warnock Hersey listed firestop sealant.
  - 3. Firestopping shall be provided whether or not there are any clips, angles, plates, or other members bridging or interconnecting the facing and floor systems, and whether or not such items are continuous.
  - 4. Provide firestopping to continuously fill open spaces where an exterior wall of composite type construction passes a perimeter structural member, such as a girder, beam or strut, and the finish on the interior wall face does not continue up to close with the underside of the structural floor above, thus interrupting the fire-resistive integrity of the wall system, and creating a space that would otherwise remain open between the interior face of the wall and lower edge of the structural members.
- D. Interior Walls and Partitions:
  - 1. Construction joints between top of fire rated walls and underside of floors above shall be firestopped.
  - 2. Firestop systems installed shall have been tested by either UL or Warnock Hersey, including exposure to hose stream test and including test for use with steel fluted deck floor assemblies.
  - 3. Firestop system used shall allow for deflection of floor or roof above.
- E. Penetrations:
  - 1. Penetrations include conduit, cable, wire, pipe, duct or other elements which pass through one or both outer surfaces of a fire rated floor, wall, or partition.
  - 2. Provide firestopping to fill spaces in accordance with ASTM E 814 (UL 1479) where a penetration occurs through a structural floor or roof and a space would

otherwise remain open between the surfaces of the penetration and the edge of the adjoining structural floor or roof, except at floors on grade.

3. Requirements for penetrations shall apply whether or not sleeves have been provided. Firestop the annular space between sleeve and surrounding surfaces.

#### 3.04 CLEANING

- A. During the course of the Work and on completion, remove and dispose of excess materials, equipment and debris away from premises. Leave Work in clean condition in accordance with Section 01500.

END OF SECTION

**SECTION 07600**  
**FLASHING AND SHEET METAL**

**PART 1 GENERAL**

1.01 SUMMARY

- A. Section Includes: Flashings, sheet metal work and related items including, but not limited to:
  - 1. Counterflashing at vertical surfaces.
  - 2. Trim at wall bottom and tops.

1.02 SUBMITTALS

- A. Shop Drawings: Submit Drawings indicating type of material, gage, dimensions, profiles, locations where used, fastening and anchoring methods, joints, and provisions of expansion and contraction.

1.03 QUALITY ASSURANCE

- A. Standards:
  - 1. Comply with design and installation methods of SMACNA Architectural Sheet Metal Manual.
  - 2. Comply with The NRCA Roofing and Waterproofing Manual installation details.

1.04 DELIVERY, STORAGE AND HANDLING

- A. Packing and Shipping: Deliver materials to site in Manufacturer's original unopened packaging with labels intact.
- B. Storage: Adequately protect against damage while stored at the site.
- C. Handling: Comply with Manufacturer's instructions.

**PART 2 PRODUCTS**

2.01 MATERIALS

- A. Galvanized Steel: ASTM A653, 24 gage (0.50mm) minimum and as indicated, with G-60 coating.
- B. Solder: ASTM B32, 50/50 type.
- C. Flux: FS O-F-506.
- D. Sealant: As specified in Section 07900.
- E. Asphalt Primer: ASTM D41.
- F. Sheet Metal Fasteners: Galvanized steel with soft neoprene washers at exposed fasteners.

2.02 FABRICATION

- A. Fabricate sheet metal with lines, arris, and angles sharp and true, and plane surfaces free from objectionable wave, warp or buckle. Hem exposed edges to form a 1/2 inch (12mm) wide hem on the side concealed from view.
- B. Forming, anchoring, expansion and contraction details, shall conform to referenced quality standards.

- C. Provide for thermal expansion of running trim, flashing, expansion joints, and other items exposed for more than 15 feet continuous length.
- D. Fabricate cleats and starter strips of same material as sheet.
- E. Solder and seal metal joints. After soldering, remove flux. Wipe and wash solder joints clean.
- F. Form sheet metal pans 6 inch (150mm) nominal square size, with 3 inch (75mm) upstand, and 4 inch (100mm) flanges. Fill pans watertight with plastic cement.

#### 2.03 FINISH

- A. Shop prepare and prime exposed ferrous metal surfaces.
- B. Backpaint concealed metal surfaces with protective backing paint to a minimum dry film thickness of 1.5 mil (0.38mm).

### **PART 3 EXECUTION**

#### 3.01 EXAMINATION

- A. Verification of Conditions: Examine subsurfaces to receive Work and report detrimental conditions in writing to Architect. Commencement of Work will be construed as acceptance of subsurfaces.
- B. Coordination: Coordinate with other Work which affects, connects with, or will be concealed by this Work.

#### 3.02 INSTALLATION

- A. Installation shall conform to NRCA and SMACNA manuals.
- B. Where dissimilar materials abut, provide proper separation or protection to minimize the possibility of galvanic action.
- C. Soldering:
  - 1. Except where other methods of joining are indicated or specified, solder joints and connections of Sheet Metal Work.
  - 2. Remove grease and dirt from metal surfaces to be joined.
  - 3. Remove flux residue by scrubbing, neutralizing with ammonia or a 5 to 10 percent solution of washing soda, followed by a clear water rinse.
  - 4. Assemble parts and solder using regular non-corrosive resin flux. Heat metal thoroughly to completely sweat solder through full contact area.

#### 3.03 CLEANING

- A. During the course of the Work and on completion, remove and dispose of excess materials, equipment and debris away from premises. Leave Work in clean condition in accordance with Section 01500.

END OF SECTION

**SECTION 07600**  
**FLASHING AND SHEET METAL**

**PART 1 GENERAL**

1.01 SUMMARY

- A. Section Includes: Flashings, sheet metal work and related items including, but not limited to:
  - 1. Counterflashing at vertical surfaces.
  - 2. Trim at wall bottom and tops.

1.02 SUBMITTALS

- A. Shop Drawings: Submit Drawings indicating type of material, gage, dimensions, profiles, locations where used, fastening and anchoring methods, joints, and provisions of expansion and contraction.

1.03 QUALITY ASSURANCE

- A. Standards:
  - 1. Comply with design and installation methods of SMACNA Architectural Sheet Metal Manual.
  - 2. Comply with The NRCA Roofing and Waterproofing Manual installation details.

1.04 DELIVERY, STORAGE AND HANDLING

- A. Packing and Shipping: Deliver materials to site in Manufacturer's original unopened packaging with labels intact.
- B. Storage: Adequately protect against damage while stored at the site.
- C. Handling: Comply with Manufacturer's instructions.

**PART 2 PRODUCTS**

2.01 MATERIALS

- A. Galvanized Steel: ASTM A653, 24 gage (0.50mm) minimum and as indicated, with G-60 coating.
- B. Solder: ASTM B32, 50/50 type.
- C. Flux: FS O-F-506.
- D. Sealant: As specified in Section 07900.
- E. Asphalt Primer: ASTM D41.
- F. Sheet Metal Fasteners: Galvanized steel with soft neoprene washers at exposed fasteners.

2.02 FABRICATION

- A. Fabricate sheet metal with lines, arris, and angles sharp and true, and plane surfaces free from objectionable wave, warp or buckle. Hem exposed edges to form a 1/2 inch (12mm) wide hem on the side concealed from view.
- B. Forming, anchoring, expansion and contraction details, shall conform to referenced quality standards.

- C. Provide for thermal expansion of running trim, flashing, expansion joints, and other items exposed for more than 15 feet continuous length.
- D. Fabricate cleats and starter strips of same material as sheet.
- E. Solder and seal metal joints. After soldering, remove flux. Wipe and wash solder joints clean.
- F. Form sheet metal pans 6 inch (150mm) nominal square size, with 3 inch (75mm) upstand, and 4 inch (100mm) flanges. Fill pans watertight with plastic cement.

#### 2.03 FINISH

- A. Shop prepare and prime exposed ferrous metal surfaces.
- B. Backpaint concealed metal surfaces with protective backing paint to a minimum dry film thickness of 1.5 mil (0.38mm).

### **PART 3 EXECUTION**

#### 3.01 EXAMINATION

- A. Verification of Conditions: Examine subsurfaces to receive Work and report detrimental conditions in writing to Architect. Commencement of Work will be construed as acceptance of subsurfaces.
- B. Coordination: Coordinate with other Work which affects, connects with, or will be concealed by this Work.

#### 3.02 INSTALLATION

- A. Installation shall conform to NRCA and SMACNA manuals.
- B. Where dissimilar materials abut, provide proper separation or protection to minimize the possibility of galvanic action.
- C. Soldering:
  - 1. Except where other methods of joining are indicated or specified, solder joints and connections of Sheet Metal Work.
  - 2. Remove grease and dirt from metal surfaces to be joined.
  - 3. Remove flux residue by scrubbing, neutralizing with ammonia or a 5 to 10 percent solution of washing soda, followed by a clear water rinse.
  - 4. Assemble parts and solder using regular non-corrosive resin flux. Heat metal thoroughly to completely sweat solder through full contact area.

#### 3.03 CLEANING

- A. During the course of the Work and on completion, remove and dispose of excess materials, equipment and debris away from premises. Leave Work in clean condition in accordance with Section 01500.

END OF SECTION

## SECTION 07900

### JOINT SEALERS

#### PART 1 GENERAL

##### 1.01 SUMMARY

- A. Section Includes: Sealant and backing materials as shown on Drawings.
- B. Related Sections:
  - 1. Section 07270 - Firestopping: Sealants at fire penetrations.

##### 1.02 SUBMITTALS

- A. General: Submittal requirements are specified in Section 01300 Submittals.
- B. Product Data:
  - 1. Submit manufacturer's specifications and installation instructions.
  - 2. Submit sample warranty to be signed jointly by applicator and manufacturer.
  - 3. Submit manufacturer's standard color chart.

##### 1.03 QUALITY ASSURANCE

- A. Qualifications: Installers shall be thoroughly trained and experienced in the necessary skills and shall be thoroughly familiar with the specified requirements.
- B. Field Samples: Caulk a section of joint as directed, under job conditions, at least 7 days prior to start of work for review by Architect. When approved, sample shall be used as a standard of comparison for remainder of work.

##### 1.04 DELIVERY, STORAGE AND HANDLING

- A. Packing and Shipping: Deliver materials to site in manufacturer's original unopened packaging with labels intact.
- B. Storage: Adequately protect against damage while stored at the site.
- C. Handling: Comply with manufacturer's instructions.

##### 1.05 PROJECT/SITE CONDITIONS

- A. Environmental Requirements: Observe manufacturer's temperature service range. Do not apply sealant when weather conditions will inhibit bonding and curing.

##### 1.06 WARRANTY

- A. Provide 3 year warranty, in writing and signed jointly by the installer and sealant manufacturer, to replace sealants which fail at no additional cost to the Owner because of loss of cohesion or adhesion, or do not cure, and which fail to achieve air-tight and water-tight seal.

## PART 2 PRODUCTS

### 2.01 MANUFACTURERS

- A. Furnish products of one of the following manufacturers, except as approved by the Architect, subject to compliance with specifications requirements:
  - 1. Pecora
  - 2. Tremco
  - 3. Dow Corning Corp.
  - 4. General Electric
  - 5. Sika Corp.
- B. Single Source Responsibility for Joint Sealer Materials:
  - 1. Obtain joint sealer materials from a single manufacturer for each different product required.
  - 2. If sealants from separate manufacturers must be used and could come in contract with each other, provide written certification from every manufacturer involved that the sealants are compatible and will adhere to each other.

### 2.02 MATERIALS

- A. General: Sealants, primers, back-up materials, preformed joint fillers, bond breakers and related materials shall be compatible with adjoining materials.
- B. Sealant:
  - 1. General: The selection of proper sealant for a particular joint shall be in accordance with current published recommendations of the manufacturer.
  - 2. Types: See Schedule in Part 3 for the location where each type of sealant is to be provided.
    - a. Type "A": 2-part or 3-part (self-leveling) urethane, conforming to ASTM C920, Type M, Grade P, Class 25, Use T; Pecora NR-200 Urexpam Sealant or Dynatred, Tremco THC-900/901 and Sikaflex 2c SL (self-leveling).
    - b. Type "B": 3-part chemically curing polyurethane sealant conforming to ASTM C920, Type M, Grade NS, Class 25, Use NT, M, A, O, and capable of withstanding movement of 50% in extension and compression, and sustained temperatures of 250 degrees F in service. Tremco Dymeric 511 Sealant, Pecora Dynatrol II and Sikaflex 2c NS (non-sag).
    - c. Type "C-1": One-part low modulus moisture cure silicone rubber sealant conforming to FS TT-S-001543A, Class A, FS TT-S-00230C, Type II, Class A and ASTM C 920, Type S, Grade NS, Class 25, Use NT, M, G,A, and O, and capable of withstanding movement of 100% in extension and 50% in compression in service. Dow Corning 790 Silicone Glazing Sealant, Tremco Spectrem 1 and Pecora 890.
    - d. Type "C-2": One-part medium modulus neutral cure silicone rubber sealant conforming to FS TT-S-001543A, Class A, FS TT-S-00230C, Type II, Class A and ASTM C 920, Type S, Grade NS, Class 25, Use NT, M, G,A, and O, and capable of withstanding movement of 50% in extension and 50% in compression in service. Tremco Spectrem 2 and Pecora 895.
    - e. Type "D": ASTM C920, Type S, Grade NS, Class 25, Use NT, M,A,O. Sika Sikaflex 1A, Pecora Dynatrol 1, Tremco DyMonic and Pecora 345.
    - f. Type "E": Silicone rubber sealant with mold inhibitor. General Electric Sanitary 1700, Tremco Proglaze, Dow Corning 999 and Pecora 863 or 898.
    - g. Type "F": Tremco Acoustical Sealant and Pecora BA-98.
  - 3. Color: Provide standard or custom colors as selected by Architect, In general, colors shall match adjacent materials.
- C. Primer: Non-staining type, recommended by sealant manufacturer to suit application.
- D. Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.

- E. Joint Filler (Backer): ASTM D1565; round closed cell polyethylene, urethane or neoprene foam rod; oversized 30 to 50 percent; "SofRod" as manufactured by A.E.T.
- F. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.
- G. Gloss Reducer: Silica sand No. 20, color to match adjacent surface. Gloss reducer shall be provided at traffic sealant applications.

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Verification of Conditions: Examine subsurfaces to receive Work and report detrimental conditions in writing to Architect. Commencement of Work will be construed as acceptance of subsurfaces. Verify, before proceeding with this Work, that required inspections of existing conditions have been completed.
- B. Coordination: Coordinate with other work which affects, connects with, or will be concealed by this Work.

#### **3.02 PREPARATION**

- A. Clean, prepare, and prime joints in accordance with manufacturer's instructions. Remove loose materials and other foreign matter which may impair adhesion of sealant.
- B. Verify that joint shaping materials and release tapes are compatible with sealant.
- C. Examine joint dimensions and size materials to achieve required width/depth ratios.
- D. Use joint filler to achieve required joint depths, to allow sealants to perform properly.
- E. Use bond breaker where required.
- F. Protect adjacent surfaces from damage by masking when necessary.

#### **3.03 INSTALLATION**

- A. General:
  1. Install sealant in accordance with manufacturer's instructions.
  2. In general, seal openings and other locations which normally require sealant to seal against infiltration from air, water and most insects, including; but not limited to:
    - a. Construction and expansion joints.
    - b. Joints between dissimilar materials.
    - c. Joints around windows, door frames, louvers and other penetrations and openings in the exterior wall.
    - d. Interior wall openings.
    - e. Other locations indicated on drawings.
  3. Apply sealant within recommended temperature ranges. Consult manufacturer when sealant cannot be applied within recommended temperature ranges.
- B. Joints:
  1. Free of air pockets, foreign embedded matter, ridges, and sags.
  2. Tool joints concave.
- C. Apply sealant under pressure with hand or power actuated gun or other appropriate means. Gun shall have nozzle of proper size and provide sufficient pressure to completely fill joints as detailed.
- D. Neatly point or tool joint surfaces to provide slightly concave surfaces, free of wrinkles and skips, uniformly smooth and with perfect adhesion along both sides of joint.

### 3.04 CLEANING

- A. Clean adjacent surfaces of sealant as work progresses.
- B. Use solvent or cleaning agent as recommended by sealant manufacturer.
- C. During the course of the Work and on completion, remove and dispose of excess materials, equipment and debris away from premises. Leave Work in clean condition in accordance with Section 01500.

### 3.05 SCHEDULE

- A. Expansion and Control Joints:
  - 1. Horizontal traffic: Type "A". [Provide gloss reducer.]
  - 2. Masonry, concrete to concrete, stucco, steel and wood: Type "B".
  - 3. Glass (except insulating glass or special coated glass), aluminum and plastics: Type "C-1".
  - 4. Glass (including insulating glass or special coated glass), aluminum and plastics: Type "C-2".
- B. Non-expanding Joints:
  - 1. Glass and plastics: Type "C".
  - 2. Concrete to concrete, stucco, masonry, aluminum, steel, and wood: Type "D".
- C. Mechanical (ductwork and air conditioning): Type "D".
- D. Plumbing Fixtures (around toilet, bath, kitchen fixtures, and food service equipment): Type "E".
- E. Acoustical (acoustical applications where sealant is required): Type "F".

END OF SECTION

**SECTION 08100**  
**STEEL DOORS AND FRAMES**

**PART 1 GENERAL**

1.01 SUMMARY

- A. Section Includes: Steel frames as shown on Drawings and as specified.

1.02 SUBMITTALS

- A. Shop Drawings: Submit Drawings showing elevations of each door type, typical and special details of construction, location and installation requirements for hardware, size and thickness of material.

1.03 DELIVERY AND STORAGE

- A. Deliver material under protective cover and store in dry, enclosed spaces at the site, in vertical position. Raise bottoms of doors at least 4 inches (100mm) above floor and provide wood slats between doors to avoid metal to metal contact.

**PART 2 PRODUCTS**

2.01 MANUFACTURERS

- A. Doors and frames shall be furnished by the same Manufacturer.
- B. Approved Manufacturers:
1. Steelcraft Manufacturing Co.
  2. Curries Company
  3. The Ceco Corporation
  4. The Kewanee Corp.
  5. Republic Builders Products
  6. Security Metal Products

2.02 MATERIALS

- A. Frames: ANSI/SDI 100, [16 gauge (1.2mm) steel.
- B. Glazing Beads: Minimum 20 gauge (0.80mm) steel.
- C. Steel: ASTM 366 cold-rolled or ASTM A569 hot-rolled. [Hot-dip galvanized meeting ASTM A653, Grade G60] [Electrolytic zinc-coated meeting ASTM A591, Class B]
- E. Paint: Non-lifting, rust-inhibitive grey primer meeting ANSI A224.1, compatible with field finish specified in Section 09900, applied after bonderizing.

2.04 FABRICATION - FRAMES

- A. Construct to shapes and sizes shown, meeting various wall thicknesses in accordance with ANSI/SDI-100.
- B. Back weld corners (inside face) and grind outside face to remove any material which comes through seam.
- B. Provide compression lug assembly to close and lock corner miters.
- C. Mortise, reinforce, drill and tap for standard weight, full mortise template hinges and template strike.

- D. Provide not less than three 18 gauge (1.0mm) anchors per jamb, or as shown on Drawings, spaced for maximum stiffness. . Provide adjustable 18 gauge (1.0mm) floor clips at each jamb, welded to back face of jamb, punched for securing to floor with two spaced anchors.
- E. Make cutouts for required hardware specified under Section 08710, from templates furnished. Reinforce butt cutouts with minimum 8 gauge thick steel plate drilled and tapped and welded in place. When heavy duty hinges are specified, provide high frequency reinforcing at frames for hinges. Coordinate with hardware vendor. Provide strike stops of frames with holes for three rubber door silencers; on double door frames, provide for two silencers per door at head.
- F. For openings over 42 inches (1066mm) wide and at double openings, reinforce head members full length with a matching profile of 12 gauge (2.0mm) steel. Provide anchor at midpoint of door, if practical.
- G. Construct frames for UL labeled doors in accordance with UL requirements and label as scheduled.

#### 2.05 FABRICATION - GLAZING FRAMES

- A. Construct in accordance with applicable parts of door frame Specification and as detailed. Extend partition frames around all four sides of openings.
- B. Provide glazing stops, removable one side and integral from the other side, secured with countersunk flat head Phillips screws spaced at not more than 16 inches (406mm) on center and 2 inches (50mm) from corners. Miter stops at corners.

#### 2.06 PAINTING

- A. Bonderize and prime doors and frames with one shop coat of rust inhibitive primer.

### **PART 3 EXECUTION**

#### 3.01 INSTALLATION

- A. Install metal door frames plumb, level and rigidly secure in place. Properly brace until built in. Follow recommendations of SDI-100.
- B. Fill backs of frames solid with mortar at concrete and masonry construction.
- C. Install fire doors and frames to comply with NFPA 80.

#### 3.02 CLEANING

- A. During the course of the Work and on completion of the Work, remove excess materials, equipment and debris and dispose of away from premises. Leave Work in clean condition in accordance with Section 01500.

END OF SECTION

## SECTION 08210

### WOOD DOORS

#### PART 1 GENERAL

##### 1.01 SUMMARY

- A. Section Includes: Wood doors as shown on Drawings, schedules and as specified.

##### 1.02 SUBMITTALS

- A. Shop Drawings: Submit Drawings showing schedule of door sizes and types, door details and elevations. Note discrepancies between the Drawings and door schedules, and the requirements of regulatory and testing agencies.
- B. Product Data: Submit Manufacturer's data showing door construction.
- C. Samples: Before fabrication, submit sample of each type of door to be furnished, showing face, edge, core construction and [factory] finish for each type specified.

##### 1.03 QUALITY ASSURANCE

- A. Coordination: Contractor shall be responsible for coordinating and obtaining necessary information from Hardware and Metal Frame Manufacturers. Door Manufacturer shall be responsible for coordinating necessary information received by Contractor from Hardware and Metal Frame Manufacturers in order that doors shall be properly prepared to receive hinges and hardware. Contractor shall provide door supplier with approved frame schedule, hardware schedule, and hardware templates. Furnish to door supplier 60 days prior to desired delivery date of doors.
- B. Regulatory Requirements: Fire doors shall be listed and labeled by a nationally recognized testing and certification agency, in accordance with applicable building codes. The listed doors shall meet or exceed ASTM E152, UL-10(b), or NFPA 252. Provide fire labels from Warnock-Hersey International (WHI), or Underwriters Laboratories (UL).
- C. Certification: Provide each fire rated and sound rated door with a label permanently attached at eye level, to the hinge stile, indicating the testing agency's approval for the rating required.

##### 1.04 DELIVERY, STORAGE AND HANDLING

- A. Prior to delivery, seal door edges with an approved clear sealer, compatible with finish specified.
- A. Prior to delivery, provide protection compatible with finish specified for door edges and faces.
- B. Delivery:
  - 1. Deliver doors to the jobsite only when proper storage site is available.
  - 2. Store doors in an area having controlled temperature and humidity as recommended by NWWDA, AWI and the door manufacturer.
  - 3. Store doors flat on factory pallets, or three full 2x4's (50x100), one centered and the other two 12 inches (300mm) from each end. Do not stack doors on end, or on their vertical edge.
  - 4. Protect wood doors from construction activity, dirt, and exposure to sunlight.
- C. Handling:
  - 1. Always handle doors with clean hands or gloves.
  - 2. Do not drag doors across one another.
  - 3. Maintain factory packaging or other means of protection on doors, until date of Substantial Completion.

## 1.05 WARRANTY

- A. Special Warranty: Furnish the following warranty to Owner:
  - 1. Warrant doors from the date of installation against defects in materials and workmanship. Periods of warranty after date of installation:
    - a. Interior solid core and mineral core: Life of installation.
  - 2. Replacement under warranty shall include removal of the defective door, hanging, installation of hardware, and finishing.

## PART 2 PRODUCTS

### 2.01 MANUFACTURERS

- A. Doors shall be products of one of the following Manufacturers:
  - 1. Algoma
  - 2. Buell Door Company
  - 3. Eggers Industries
  - 4. Weyerhaeuser Company, Architectural Door Division

### 2.02 FLUSH DOORS

- A. Cores:
  - 1. Solid Core: Shall conform to ANSI A208.1 1LD2, 32 lbs. per cubic foot (513 kg/m<sup>3</sup>) density.
- B. Edge Bandings:
  - 1. Stiles (Dimensions given are minimum sizes allowed after factory trimming to booksize or prefitting).
    - a. Particleboard Core: 1-1/2 inch (38mm) double banded laminated hardwood stile (no finger joints allowed) in outer and outer band to be at least 1/2 inch (13mm) wide same species lumber as face veneer with the exception of birch doors which will have hard maple stiles.
    - b. Hollow Core: Stile shall be 1-1/2 inch (38mm) minimum.
  - 2. Rails (Dimensions given are minimum sizes allowed after factory trimming to booksize or prefitting).
    - a. Particleboard Core: 1-1/4 inch (32mm) minimum mill option hardwood rail.
- C. Face Veneers, Crossbands and Backers: When wood veneer or medium density overlay faces are specified, doors shall be 5 ply, made up of a face veneer, crossbanding and a core unit, all securely bonded together utilizing type 1 (fully waterproof) adhesive and the hot press assembly technique. All plies must be placed at right angles to adjacent plies. Face veneers shall have a minimum thickness of 1/50 after factory sanding and the individual pieces of veneer forming the face veneer must be spliced or edge glued together.
  - 1. Veneer:
    - a. Face veneer: A Grade Red Oak
    - b. Veneer cut: Quarter Sliced.
    - c. Veneer match: Book Match
  - 2. Cross banding shall be thoroughly dried hardwood extending full width and height of door with grain at right angles to face and back veneer.
- D. Glue: Type 1 for interior and exterior doors.

### 2.06 FACTORY FINISHING

- A. Clear Finish: AWI Section 1500 System TR-6 Catalyzed Polyurethane, in [10] [35] gloss, applied using the following steps.
  - 1. Finish sanding.
  - 2. Burnish.

3. Sealer application. Sealer to be catalyzed polyurethane coating or modified catalyzed polyurethane coating.
4. Curing.
5. Sealer denibbing.
6. Topcoat application. Topcoat to be catalyzed polyurethane coating or modified catalyzed polyurethane coating.
7. Curing.

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Examine door frames to assure that jambs are true and plumb. Correct frames which are not true and plumb before doors are hung.

#### **3.02 INSTALLATION**

- A. Doors shall be hung true and plumb with standard bevel and with uniform 3/32 inch (2mm) clearance at jambs and head, and 1/2 inch (13mm) bottom clearance, unless otherwise required. Mortise, drill or otherwise prepare doors for finish hardware specified in Section 08700, Finish Hardware.
- B. Doors that are cut or planed for fitting shall be immediately resealed with a transparent wood sealer. Doors shall operate freely without sticking or binding, without hinge-bound conditions and with hardware installed, properly adjusted and functioning.
- C. Field Finish: Provide as specified in Section 09900 and in accordance with Door Manufacturer's written instructions.
- D. Repair of Factory Finish:
  1. Clear and Stain: Minor handling marks or scratches (not through the seal coat) shall be repaired by sanding the damaged area, then topcoating again with polyurethane with a matching gloss.
  2. Opaque: If scratches or handling marks go into the base color coats, repairs shall be made under the direction of the door manufacturer. Minor scratches on the surface shall be sanded, then retopcoated with varnish with a matching gloss.

#### **3.03 CLEANING**

- A. During the course of the Work and on completion of the Work, remove excess materials, equipment and debris and dispose of away from premises. Leave Work in clean condition in accordance with Section 01500.

**END OF SECTION**

## SECTION 08710

### DOOR HARDWARE

#### PART 1 GENERAL

##### 1.01 SUMMARY

- A. Section Includes: Hardware and related items for interior and exterior doors, other than specified in specific door sections.

##### 1.02 SYSTEM DESCRIPTION

- A. Performance Requirements: The Manufacturer or Authorized Distributor shall confirm that there is an established local agency which stocks a full complement of parts and offers service during normal working hours for the finish hardware to be furnished and that the agency will supply parts without delay and at reasonable cost.
- B. Furnish hardware items of proper design for use in doors and frames of the thicknesses, profile, security and similar requirements indicated, as necessary for proper installation and function, regardless of omissions or conflicts in the information in the Contract Documents.

##### 1.03 SUBMITTALS

- A. Submit shop drawings and product data of each type of hardware required for Project, in accordance with Section 01300. Indicate the following:
  - 1. Style and finish.
  - 2. Locations and mounting heights of each item of hardware. Use established numbering system.
  - 3. Include a complete listing of equipment and materials including manufacturer, catalog number, finish, diagrams, (including cut-sheets), schematics and all other pertinent data.
- B. Templates: Supply to Door and Frame Manufacturer(s) to enable proper and accurate sizing and locations of cutouts for hardware.
- C. Certification: At the completion of installation, certify that material is properly installed according to Manufacturers printed instructions.
- D. Operating and Maintenance Data: Submit in accordance with Section 01700. Provide Owner with Manufacturer's parts list and maintenance instructions for each type of hardware supplied and necessary wrenches and tools required for proper maintenance of hardware.

##### 1.04 QUALITY ASSURANCE

- A. Standards: Comply with the following:
  - 1. ANSI/NFPA 80 - Fire Doors and Windows.
  - 2. UL Standard 305 - Panic Hardware.
- B. Regulatory Requirements: Comply with the following:
  - 1. ANSI A117.1 "Making Buildings and Facilities Accessible to and Usable by Physically Handicapped People."
  - 2. Public Law 101-336 "The Americans with Disabilities Act of 1990 (ADA).
  - 3. ADA Accessibility Guidelines (ADAAG).
  - 4. Uniform Federal Accessibility Standards (UFAS).
  - 5. The Arizonans with Disabilities Act of 1992 Administrative Rules (AzDAAG)
- C. Supplier Qualifications:
  - 1. Employ an AHC member of the DHI.
  - 2. Factory authorized stocking distributor of the approved items.
  - 3. Holder of legally required licenses.

- C. Manufacturer Qualifications: 5 years experience in manufacture of comparable systems.
- D. Regulatory Requirements:
  - 1. Hardware listed or furnished shall meet requirements of Federal, State and Local codes having jurisdiction.
  - 2. Any item furnished or installed that does not meet code requirements shall be removed and proper items substituted at no additional cost or expense to the Owner.
  - 3. Provide hardware for fire-rated openings in compliance with A.I.A. (NBFU) Pamphlet No. 80 and NFPA Standards No. 80 and No. 101. This requirement shall take precedence over other requirements for such hardware.
  - 4. Provide hardware which has been tested and listed by U.L. for the types and sizes of doors required, and which complies with the requirements of the doors and door frame labels.
  - 5. Provide 3-point latches at aluminum double doors used as entrance, not egress exit.
  - 6. Hardware on all doors leading to or from electrical rooms, mechanical rooms, service stairs, dock areas and the like which represent a hazard to the blind, shall have knurling or abrasive coating on the door lever, handle, or bar which will alert the user to potential perils present. The hardware product and installation shall satisfy all governing handicapped codes.

#### 1.05 DELIVERY, STORAGE AND HANDLING

- A. Packing and Shipping: Package each item of hardware in original and individual containers, complete with all necessary fastenings, keys, instructions, and templates for spotting mortising tools.
  - 1. Mark each container with its item number corresponding to the item number on the finish hardware schedule.
  - 2. Containers holding locks shall show the following corresponding to that shown on the finish hardware schedule:
    - a. Heading number
    - b. Door number
    - c. Hand of door (when required)
    - d. Keying symbol (developed by Owner)
  - 3. A typewritten schedule in DHI format conforming with the approved schedule shall accompany each shipment.
- B. When hardware must be installed at the factory, the hardware supplier shall send all such needed items to the respective supplier for their use in installation. The cost of this shipping requirement shall be borne by the hardware supplier.
- C. Acceptance at Site: Upon delivery of the finish hardware to the job site, check in and sign for all material delivered and thereafter be responsible for same.
- D. Storage and Protection: Provide a secured area with sufficient space and shelving in which to store and inventory all materials under lock and key. Protect hardware from damage at all times.

#### 1.06 WARRANTY

- A. Warranty hardware against defects in materials and workmanship for 2 years. Repair, replace or otherwise correct deficient materials at no additional cost to Owner.
  - 1. Locksets: 3 year warranty.
  - 2. Closers: 10 year warranty.

## PART 2 PRODUCTS

### 2.01 MANUFACTURERS

- A. Products equaling or exceeding quality requirements of the specified product as manufactured by the following are acceptable:
1. Butts: Stanley, McKinney.
  2. Exit Devices: American Device, Von Duprin, Precision.
  3. Locksets: BEST, Schlage, Yale.
  4. Closers: LCN, Norton, Dorma.
  5. Thresholds, Door Bottoms, Weatherstripping: Pemko, Hager, Ultra.
  6. Stops, Kickplates, Pulls, Push Plates: BBW, Trimco, Hager.
  7. Pocket Door Hardware: Hager, Stanley, Grant.
  8. Overhead Concealed Closers: LCN, Dorma.
  9. Coordinators and Automatic Flush Bolts: DCI, BBW, Trimco, Hager.
  10. Push/Pull Latches: ABH, BBW, Trimco.
  11. Digital Locks: Unican.
- B. To the greatest extent possible, obtain all finish hardware of the same type of item from only one Manufacturer.

### 2.02 HARDWARE

- A. General:
1. Provide items as listed in schedule complete to function as intended.
  2. Manufacture hardware supplied for metal doors or jambs to template and secure with machine screws.
  3. Where cylindrical locks are used in hollow metal doors, furnish lock reinforcing in the door at the time of manufacture.
  4. Furnish finish hardware with all necessary screws, bolts, or other fastenings of suitable size and type to anchor the hardware in position for heavy use and long life, and of compatible material and finish.
  5. Furnish fastenings with anchors according to the material to which it is applied, and as recommended by the Manufacturer.
  6. Furnish hardware fastened to concrete with machine screws and tampins.
  7. Fasten closers on wood or mineral core doors with conventional fasteners, unless sex nuts and bolts are required by UL. Other than that required by UL, no sex nuts and bolts shall be allowed for installation.
  8. For surface mounted closer, pivot hinges, concealed closers or holders or other hardware mortised into the top or bottom edges, edges shall be a minimum of 4-1/2 inches (115mm), thoroughly kiln-dried hardwood.
- B. Finishes: US 26D (652), dull chrome, and US 32D (630), satin stainless steel, unless scheduled otherwise.
- C. Butt Hinges:
1. Determine correct clearance from the Drawings.
  2. Provide non-removable pins on exterior outswinging doors and reverse bevel interior locked doors.
  3. Doors with closers shall have ball bearing butts.
  4. Flat button, top and bottom tips required.
  5. Butt Hinge Length: As recommended by Manufacturer.
  6. Number of Butt Hinges Required: As recommended by Manufacturer.
- D. Door Locks and Latchsets: Types, series, designs, functions and finishes as listed in hardware sets.
1. Design shall permit removal of cylinder without removing lock from door.
  2. Provide locks and latchsets with 2-3/4 inch (70mm) backset unless otherwise noted.
  3. Provide strikes with extended lip where required to protect trim from being marred by latch bolt.
  4. Provide wrought boxes with strikes.
- E. Door Closers:

1. Surface mounted without covers, finish sprayed to match other hardware.
  2. Bodies to be close grained malleable iron, with 3 separate control valves (including backcheck) ANSI Grade 1 or aluminum, ANSI Grade 1..
  3. Closer to be equipped with size adjustment (1 through 6) in the field by the installer.
  4. Equip closers mounted on wood or mineral core doors with conventional fasteners. Sex nuts and bolts shall not be allowed.
  5. Closers to be installed on interior of door.
  6. Provide EDA arms for parallel applications.
  7. Provide type as listed in sets.
- F. Exit Devices:
1. U.L. approved for Casualty.
  2. Fire doors to be equipped with UL rated exit devices meeting the fire label requirement.
  4. Devices to match in design.
  5. Types, functions and finishes as listed in hardware sets.
- G. Push Plates: Type and size as listed.
- H. Pull Plates: Type and size as listed.
- I. Kickplates and Armorplates: Size as listed. Provide 1/8 inch (3mm) thick plastic, B4E, color to be black.
- J. Overhead Holders or Stops: As listed in hardware sets.
- K. Stops and Bumpers: Wall type WC9XT shall be used when possible. Locate wall bumpers to prevent lockset lever or closer from touching wall. Walls to receive proper backing for wall bumpers as specified in Section 06100 - Rough Carpentry.
- L. Silencers: At metal frames; 3 at each jamb of single doors, 2 at each jamb of double doors. Not required on doors having weatherstrip or seals.
- M. Flushbolts: As listed in hardware sets.
- N. Weatherproofing, Smoke Seals and Door Bottoms:
1. Continuous at head and jamb of exterior doors; continuous smoke seals at head and jamb of corridor doors.
- O. Thresholds: Sized for opening; to meet handicapped conditions. Provide as detailed on Drawings, or as listed in hardware sets.
- P. Knox Box: Model 3200-R, 4"W x 5"H x 3-1/4" deep (100mmW x 127mmH x 83mm deep) with 7"W x 7"H (178mm W x 178mm W) flange, black polyester powder coat finish.

### 2.03 KEYING

- A. Door Locks: Keyed in like-groups
- B. Supply 2 keys for each lock.

- C. Supply keys in following quantities:
  - 1. 2 master keys.
  - 2. 2 grand master keys.
- D. Permanent keys will not be made available to the General Contractor or any Subcontractor or Supplier under any circumstances .

**PART 3 EXECUTION**

3.01 EXAMINATION

- A. Verification of Conditions: Examine conditions under which finish hardware will be installed. Report deficiencies to the Architect.

3.02 INSTALLATION

- A. Install hardware in accordance with Manufacturer's recommendations, using proper templates.
- B. Maintain ANSI standard mounting heights for doors, from finished floor to center line of hardware item.
- C. Knox Box: Recessed into wall construction and rigidly anchored in place at locations indicated on Drawings in accordance with requirements for Fire Department access.

3.03 CLEANING

- A. During the course of the Work and on completion, remove and dispose of excess materials, equipment and debris away from premises. Leave Work in clean condition in accordance with Section 01500.

**END OF SECTION**

## SECTION 08800

### GLAZING

#### PART 1 GENERAL

##### 1.01 SUMMARY

- A. Section Includes: Glass and glazing as shown on Drawings and as specified.

##### 1.02 PERFORMANCE REQUIREMENTS

- A. Glass and glazing materials shall provide continuity of building enclosure vapor and air barrier.
  - 1. To utilize the inner pane of multiple pane sealed units for the continuity of air and vapor seal.
  - 2. Maintain continuous air and vapor barrier throughout glazed assembly from glass pane to heel bead of glazing sealant.
- B. Size glass to withstand dead loads and positive and negative live loads acting normal to plane of glass as calculated in accordance with UBC Chapter 54, as measured in accordance with ANSI/ASTM E330.
- C. Limit glass deflection to 1/200 or flexure limit of glass, with full recovery of glazing materials, whichever is less.

##### 1.03 SUBMITTALS

- A. Product Data: Submit structural, physical and environmental characteristics, size limitations, special handling or installation requirements for glass and plastic materials.
- B. Product Data: Submit chemical, functional, and environmental characteristics, limitations, special application requirements for glazing materials. Identify available colors.
- C. Samples: Submit samples as follows:
  - 1. Two samples 8 x 8 inch (200 x 200mm) in size, illustrating glass and plastic units, coloration and design.
  - 2. Four inch long bead of glazing sealant, color as selected.
- D. Manufacturer's Certificate: Submit Manufacturer's certification that sealed insulated glass meets or exceeds specified requirements.

##### 1.04 QUALITY ASSURANCE

- A. Regulatory Requirements: Conform to 1994 UBC Chapter 24, to local requirements and to State law.
- B. Standards:
  - 1. ANSI/ASTM E330 - Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
  - 2. ANSI Z97.1 - Safety Performance Specifications and Methods of Test for Safety Glazing Used in Buildings.
- C. Perform Work in accordance with FGMA Glazing Manual, FGMA Sealant Manual, and Laminators Safety Glass Association - Standards Manual for Glazing Installation Methods.

##### 1.05 DELIVERY, STORAGE AND HANDLING

- A. Packing and Shipping: Deliver materials to site in Manufacturer's original unopened packaging with labels intact.
- B. Storage: Adequately protect against damage while stored at the site.

- C. Handling: Comply with Manufacturer's instructions.

#### 1.06 WARRANTY

- A. Provide [5] [10] year [Manufacturer's] warranty for sealed glass units from seal failure, interpane dusting or misting, and replacement of same.

### **PART 2 PRODUCTS**

#### 2.01 MANUFACTURERS

- A. Glass Materials: Furnish products of one of the following Manufacturers, except as approved by the Architect, subject to compliance with Specification requirements:
  1. Guardian Industries
  2. LOF
  3. PPG Industries

#### 2.02 GLASS MATERIALS

- A. Float Glass: ASTM C1036, Type 1 transparent flat, Class 1 clear, Quality q3 glazing select; 1/4 inch (6mm) thick minimum.
- B. Safety Glass: ASTM C1048, Kind FT fully tempered with horizontal tempering Condition A uncoated, Type 1 transparent flat, Class 1 clear, Quality q3 glazing select; conforming to ANSI Z97.1; 1/4 inch (6mm) thick minimum.

#### 2.03 GLAZING ACCESSORIES

- A. Setting Blocks: Neoprene or other resilient blocks of 70 to 90 Shore A durometer hardness tested for compatibility with glazing sealant, minimum length 4 inches (100mm).
- B. Spacers: Neoprene blocks of 40 to 50 Shore A durometer hardness, adhesive backed on one face only and tested for compatibility with specified glazing sealant.
- C. Interior Glazing Compound: Polymerized Butyl Rubber and Inert Fillers (pigments), solvent based with minimum 75% solids, non-sag consistency, tack-free time of 24 hours or less, paintable non-staining.
- D. Exterior Glazing Compound: Conforming to ASTM C920, Type S, Grade NS, Use G. Compound shall be paintable, or colored to match frame.
- E. Glazing Tape: Preshimmed 10 percent solids, non-shrinking, butyl rubber tape compatible with sealants. If exposed, tape shall be paintable, or colored to match frame.
- F. Butt Glazing Sealant: GE 1200 Series Silicone, clear.
- G. Mirror Mastic: Polymer type mirror mastic resistant to water, shock, cracking, vibration and thermal expansion.
  1. Mastic: Compatible with mirror backing paint and approved by mirror manufacturer.

## 2.06 MARKINGS

- A. Tempered glass shall have each light permanently etched with Manufacturer's name and his compliance with ANSI Z-97.1.

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Verification of Conditions: Examine subsurfaces to receive Work and report detrimental conditions in writing to Architect. Commencement of Work will be construed as acceptance of subsurfaces.
- B. Examine framing or glazing channel surfaces, backing, removable stop design, and conditions under which glazing is to be performed.
- C. Coordination: Coordinate with other Work which affects, connects with, or will be concealed by this Work.

### 3.02 INSTALLATION

- A. Comply with combined recommendations of Glass Manufacturer and manufacturer of sealants and other materials used in glazing., except where more stringent requirements are shown or specified.
- B. Clean the glazing, channel, or other framing members to receive glass, immediately before glazing. Remove coatings which are not firmly bonded to the substrate.
- C. Do not attempt to cut, seam, nip or abrade glass which is tempered or heat strengthened.
- D. Comply with "Glazing Manual" by FGMA, except as shown and specified otherwise by Manufacturers of glass and glazing materials.
- E. Inspect each piece of glass immediately before installation, and discard those which have observable edge damage or face imperfections.
- F. Install setting blocks of proper size at quarter points of sill rabbet.
- G. Provide spacers inside and out, and of proper size and spacing, for glass sizes larger than 50 united inches (1270 united mm). Provide 1/8 inch (3mm) minimum bite of spacers on glass and use thickness equal to sealant width.
- H. Unify appearance of each series of lights by setting each piece to match others as nearly as possible. Inspect each piece and set with pattern, draw and bow oriented in the same direction as other pieces.
- I. Miter cut and bond ends together at corners where gaskets are used for channel glazing, so that gaskets will not pull away from corners and result in voids or leaks in the glazing system.

### 3.03 INTERIOR COMBINATION METHOD (TAPE AND SEALANT)

- A. Cut glazing tape to proper length and install against permanent stop, projecting 1/16 inch (1.5mm) above sightline.
- B. Place setting blocks at 1/4 point.
- C. Rest glass on setting blocks and push against tape with sufficient pressure to ensure full contact and adhesion at perimeter.
- D. Install removable stops; spacer strips inserted between glass and applied stops at 2 foot (600mm) intervals, 1/4 inch (6mm) below sightline.

- E. Fill gap between glass and applied stop with sealant to depth equal to bite of frame on glass to uniform and level line.
- F. Neatly trim off excess tape to sightline.

#### 3.04 ADJUSTING

- A. Remove and replace glass which is broken, chipped, cracked, abraded or damaged in any other way during the construction period, including natural causes, accidents and vandalism.

#### 3.05 CLEANING

- A. During the course of the Work and on completion, remove and dispose of excess materials, equipment and debris away from premises. Leave Work in clean condition in accordance with Section 01500.
- B. Remove labels after Work is completed.
- C. Clean acrylic sheet glazing in accordance with Manufacturer's instructions.

#### 3.09 PROTECTION

- A. Protect glass from breakage immediately upon installation, by attachment of crossed streamers to framing held away from glass.
- B. Do not apply markers of any type to surfaces of glass.

END OF SECTION

## SECTION 09100

### METAL SUPPORT ASSEMBLIES

#### PART 1 GENERAL

##### 1.01 SUMMARY

- A. Section Includes: Formed metal stud framing, furring, suspension systems and accessories as shown on Drawings and as specified.

##### 1.02 SUBMITTALS

- A. Product Data: Submit data describing standard framing member materials and finish, product criteria, load charts, limitations, and installation instructions.
- B. Certificates: Mill Certification shall be provided with shipment to verify chemical composition, yield strength, tensile strength, elongation and coating thickness. Include listing of applicable ASTM standards specified in this section and comparison of ASTM requirements to actual materials provided to jobsite.
- C. Manufacturer's letter: Manufacturer shall provide letter stating that the material supplied to the specific project meets or exceed the performance standards listed in these specifications.

##### 1.03 QUALITY ASSURANCE

- A. Perform Work in accordance with ASTM C 754 requirements.

#### PART 2 PRODUCTS

##### 2.01 MANUFACTURERS

- A. Furnish products of one of the following Manufacturers, except as approved by the Architect, subject to compliance with Specification requirements:
  1. American Studco Inc.
  2. Gold Bond Building Products Div., National Gypsum.
  3. Unimast, Inc.
  4. Western
  5. CEMCO
  6. Dietrich Industries
  7. Manufacturing members of the Metal Stud Manufacturer's Association, Corvallis, Oregon, (503) 757-8991

##### 2.02 FRAMING MATERIALS

- A. Studs, Runners and Furring Channels:
  1. ASTM C 645, electro-galvanized to meet ASTM A 591, manufactured from steel supplied in accordance with ASTM A 653, Structural Quality Grade 33; G60 designation galvanized sheet steel.
  2. Thickness: [20 (0.80mm)] gage for studs and runners, and 25 gage (0.45mm) for channels. Furnish 20 gage studs at single layer gypsum board receiving ceramic tile finish and for walls over 14 feet high.
  3. Slotted Top Track - Single Track Slip System for Interior Partitions: As manufactured by Metal Lite, Inc., 3070 E. Miraloma Avenue, Anaheim, CA 92806 (800) 886-6824.
- B. Studs: C-shaped, non-load bearing rolled steel, punched for utility access, of size shown on Drawings.
- C. Ceiling Runners: Cold or hot-rolled steel, meet ASTM C 754.
- D. Hanger and Tie Wire: Meet ASTM C 754.

- E. Furring and Bracing Members: Of same gauge, material and finish as studs, thickness to suit purpose.
- F. Clips, Brackets: Galvanized wire or sheet metal designed for attachment of furring members.
- G. Fasteners: GA 203, self-drilling, self-tapping screws.
- H. Anchorage Devices: Power driven, powder actuated, drilled expansion bolts or screws with sleeves as required for positive anchorage.
- I. Acoustic Sealant: As specified in Section 09250.
- J. Primer: FS TT-P-645, for touch-up of galvanized surfaces.
- K. Backing: "Notch-Tite" and "Flush Mount" as manufactured by Metal Lite, Inc., 3070 E. Miraloma Avenue, Anaheim, CA 92806 (800) 886-6824.

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Verify that conditions are ready to receive Work.
- B. Verify field measurements are as shown on Drawings.
- C. Verify that rough-in utilities are in proper location.
- D. Beginning of installation means acceptance of substrate.

#### **3.02 METAL STUD ERECTION**

- A. Install stud framing in accordance with ASTM C 754.
- B. Align and secure top and bottom runners at 24 inches (600mm) o.c. Place two beads of acoustic sealant between runners and substrate.
- C. Fit runners under and above openings; secure intermediate studs at spacing of wall studs.
- D. Install studs vertically at 24" o.c.; unless indicated otherwise on Drawings. Place two beads of acoustic sealant between studs and adjacent vertical surfaces. Install felt strips between wall and stud where studs abut exterior walls.
- E. Connect studs to tracks using fastener method.
- F. Door Opening Framing: Install double studs at door frame jambs. Install stud tracks on each side of opening, at frame head height, and between studs and adjacent studs.
- G. Backing and Blocking: Provide backing and blocking attached to studs. Bolt or screw steel channels to studs. Install backing and blocking for support of plumbing fixtures, toilet partitions, wall cabinets, toilet accessories, and hardware. If proprietary system is used, install in accordance with manufacturer's printed instructions.
- H. Coordinate installation of bucks, anchors, blocking, electrical and mechanical Work placed in or behind partition framing.
- I. Splice studs with 8 inch (200mm) nested lap, secure each stud flange with flush head screw.
- J. Construct corners using minimum three studs.
- K. Brace stud framing system and make rigid.

- L. Coordinate erection of studs with requirements of door and window frame supports and attachments.
- M. Align stud web openings.
- N. Refer to Drawings for indication of partitions extending to ceiling only and for partitions extending through ceiling to structure above. Maintain clearance under structural building members to avoid deflection transfer to studs. Provide nested extended leg ceiling runners or proprietary slip track.
- O. Coordinate placement of insulation in multiple stud spaces made inaccessible after stud framing erection.

### 3.03 WALL FURRING INSTALLATION

- A. Erect wall furring for direct attachment to concrete, brick masonry and concrete walls.
- B. Erect furring channels vertically. Secure in place on alternate channel flanges at maximum 24 inches (600mm).
- C. Space furring channels maximum 16 inches (400mm) on center, not more than 4 inches (100mm) from floor and ceiling lines, and butting walls.
- D. Install furring channels directly attached to concrete and brick masonry and concrete walls, as applicable in accordance with Manufacturer's instructions.
- E. Erect free-standing metal stud framing tight to concrete, concrete and brick masonry walls, attached by adjustable furring brackets in accordance with Manufacturer's instructions.

### 3.04 ACOUSTICAL AND FIRE RATINGS

- A. Install framing and furring as required for indicated acoustical and fire ratings.

### 3.05 CEILING FRAMING INSTALLATION

- A. Install in accordance with ASTM C 754.
- B. Coordinate location of hangers with other Work.
- C. Install ceiling framing independent of walls, columns and above-ceiling Work.
- D. Reinforce openings in ceiling suspension system which interrupt main carrying channels or furring channels, with lateral channel bracing. Extend bracing minimum 24 inches (600mm) beyond each end of openings.
- E. Laterally brace entire suspension system.
- F. No hanger support shall be allowed from roof deck.
- G. At steel beams, joists or other steel construction wrap hangers around, inset through, or clip or bolt to the supports, so as to develop the full strength of the hangers.
- H. For cast-in-place concrete install hanger wires in the formwork using double looped hangers. Special insets, at least equivalent in strength to the hangers, to which the hangers can later be attached, may be inserted through or attached to the top of the forms in lieu of anchoring the hangers directly in the concrete.
- I. Grout hangers into cell of hollow core slab units or mechanical fasteners must be used to attach hangers.
- J. Attach hanger wires at concrete tee units by ram-set method only on the sides of the tee stems, at least 6 inches (150mm) above the bottom of the stem. Attach with drilled stud type fasteners at other areas of tee units. Where tees receive conventional concrete

topping hanger wires may be placed between joints of units provided double looped hangers are used.

- K. At lights or other openings that interrupt the main runner or furring channels reinforce grillage with 3/4 inch (19mm) cold-rolled channels, wire tied atop and parallel to the main runner channels.
- L. Do not bridge control and expansion joints with metal furring. Provide separate supports on each side of joint.
- M. Fabricate and bend curved furring to required curves and radii in the shop.

### 3.06 FIELD QUALITY CONTROL

- A. Testing: At Owner's request, Contractor shall provide spot testing of actual properties of steel framing to verify compliance with specifications.

### 3.07 CLEANING

- A. During the course of the Work and on completion, remove and dispose of excess materials, equipment and debris away from premises. Leave Work in clean condition in accordance with Section 01500.

END OF SECTION

**SECTION 09250**  
**GYPSUM BOARD**

**PART 1        GENERAL**

1.01    SUMMARY

- A.      Section Includes: Gypsum board and joint treatment as shown on the Drawings and as specified.

1.02    SYSTEM DESCRIPTION

- A.      Acoustic Attenuation for Interior Partitions (as indicated on drawings):

1.03    SUBMITTALS

- A.      Product Data: Submit data on gypsum board, joint, finish and accessories.
- B.      Samples: Submit sample of textured finish prior to application.
- C.      Reports: Submit fire test report for fire rated assemblies, and acoustical performance test reports for acoustically-rated assemblies.

1.04    QUALITY ASSURANCE

- A.      Applicator Qualifications: Company specializing in Gypsum Board Systems Work with 2 years documented experience and approved by Manufacturer.
  
- D.      Comply with applicable specification recommendations of GA-216 and GA-600 as published by the Gypsum Association.

1.05    DELIVERY, STORAGE AND HANDLING

- A.      Comply with GA-216 and Manufacturer's directions.

1.06    PROJECT CONDITIONS

- A.      Environmental Requirements:
  - 1.      Maintain temperature of installed gypsum board spaces in range of 55 degrees F. (13 degrees C.) to 90 degrees F. (32 degrees C.) until building is entirely closed.
  - 2.      Ventilate as required to eliminate excessive moisture.

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Furnish products of one of the following Manufacturers, except as approved by the Architect, subject to compliance with Specification requirements:
  - 1. Domtar Gypsum of Domtar Inc.
  - 2. Georgia-Pacific Corp.
  - 3. Gold Bond Building Products Div., National Gypsum Co.
  - 4. United States Gypsum Co.
  - 5. James Hardie Gypsum

### **2.02 GYPSUM BOARD MATERIALS**

- A. Standard Gypsum Board: ANSI/ASTM C36; [5/8 inch (16mm)] thick, maximum permissible length; ends square cut, tapered edges.
- B. Fire Rated Gypsum Board: ANSI/ASTM C36; [fire resistive] type, UL rated; [5/8 inch (16mm)], maximum permissible length; ends square cut, tapered edges.

### **2.03 ACCESSORIES**

- A. Adhesive: ASTM C557.
- B. Acoustical Sealant: Non-hardening, non-skinning, for use in conjunction with gypsum board, as recommended by Board Manufacturer.
- C. Corner Beads: GA216; Type CB; electro-galvanized steel.
- D. Edge Trim: GA216; Type [L] bead; electro-galvanized steel and Type LC rolled-formed zinc.
- E. Control Joint: U.S. Gypsum No. 093, roll-formed zinc.
- F. Joint Materials: ANSI/ASTM C475; reinforcing tape, joint compound, adhesive, water, and fasteners. For coated board and gypsum sheathing, use material recommended by Board Manufacturer.
- G. Screws: ASTM C1002 for steel drill screws. Type G for fastening to gypsum board, Type S for fastening to light gauge steel framing and Type W for fastening to wood framing.
- H. Wall Texture: As manufactured by USG or LaHabra Inc., multi-purpose, pre-packaged, non-asbestos type.
- I. Drywall Primer:
  - 1. Paint material specifically formulated to fill the pores and equalize the suction difference between gypsum board surface paper and the compound used on finished joints, angles, fastener heads and accessories and over skim coatings.
  - 2. Drywall primer which is applied to the finished surface of the work specified in this section shall be provided as specified under Sections 09900 and 09950 as applicable.
  - 3. A good quality, white latex drywall primer formulated with high binder solids, applied undiluted, shall be applied to gypsum board surfaces prior to the application of texture materials.

## **PART 3 EXECUTION**

### **3.01 INSPECTION**

- A. Verify that site conditions are ready to receive Work and opening dimensions are as instructed by the Manufacturer.
- B. Beginning of installation means acceptance of substrate.

### **3.02 GYPSUM BOARD INSTALLATION**

- A. Install gypsum board in accordance with GA-201 and GA-216, and Manufacturer's instructions as applicable.
- B. Erect single layer standard gypsum board in most economical direction, with ends and edges occurring over firm bearing.
- C. Erect single layer fire rated gypsum board vertically, with edges and ends occurring over firm bearing.
- D. Exterior applications:
  - 1. Erect exterior gypsum sheathing horizontally, with edges butted tight and ends occurring over firm bearing.
  - 2. Erect exterior gypsum soffit board perpendicular to supports with staggered end joints over supports.
- E. Use screws when fastening gypsum board to metal and wood furring or framing.
- F. Double Layer Applications:
  - 1. Use gypsum backing board for first layer, placed perpendicular to framing or furring members.
  - 2. Use fire rated gypsum backing board for fire rated partitions.
  - 3. Place second layer perpendicular to first layer.
  - 4. Offset joints of second layer from joints of first layer.
  - 5. Secure second layer to first with adhesive and sufficient support to hold in place. Apply adhesive in accordance with Manufacturer's instructions.
- G. Treat cut edges and holes in moisture resistant gypsum board and with sealant.
- H. Place control joints consistent with lines of building spaces as indicated on Drawings and as recommended by Board Manufacturer.
- I. Place corner beads at external corners. Use longest practical length. Place edge trim where gypsum board abuts dissimilar materials.

### 3.03 JOINT TREATMENT

- A. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
- B. Feather coats onto adjoining surfaces so that camber is maximum 1/32 inch (0.80mm).
- C. Taping, filling, and sanding is not required at surfaces behind ceramic tile..

### 3.04 ACOUSTICAL TREATMENT

- A. Install acoustical sealant in accordance with Manufacturer's instructions.
- B. Install acoustical sealant at gypsum board perimeter at:
  - 1. Metal framing: Two beads.
  - 2. Base layer of double layer applications, if applicable.
  - 3. Face layer.
  - 4. Caulk partition penetrations by conduit, pipe, ductwork, and rough-in boxes.
- C. Install acoustical sealant where gypsum board joins other walls or surfaces at sound control partitions.

### 3.05 FINISHING OF GYPSUM BOARD SURFACES

- A. Provide finish of gypsum board surfaces in accordance with the Gypsum Association "Recommended Specification: Levels of Gypsum Board Finish" as follows as noted on Room Finish Schedule:
  - 1. Level 0 (Temporary Construction): No taping, finishing, or accessories required.

2. Level 1 (Fire Taping at plenum areas above ceiling, in attics, in areas where the assembly will be concealed or in building service corridors and other areas not normally open to public view):
  - a. Joints and interior angles shall have tape embedded in joint compound.
  - b. Surface shall be free of excess joint compound.
  - c. Tool marks and ridges are acceptable.
3. Level 2 (Water resistant gypsum backing for tile):
  - a. Joints and interior angles shall have tape embedded in joint compound and wiped with a joint knife leaving a thin coating joint compound over joints and interior angles.
  - b. Fastener heads and accessories shall be covered with a coat of joint compound.
  - c. Surface shall be free of excess joint compound.
  - d. Tool marks and ridges are acceptable.
  - e. Joint compound applied over the body of the tape at the time of tape embedment shall be considered a separate coat of joint compound and shall satisfy the conditions of this level.
4. Level 3 (Appearance areas to receive heavy or medium texture (spray or hand applied) finishes before final painting, or where heavy grade wallcoverings are to be applied as final decoration. This level of finish is not to be used where smooth painted surface or light to medium wallcoverings are to be applied.):
  - a. Joints and interior angles shall have tape embedded in joint compound and one additional coat of joint compound applied over joints and interior angles.
  - b. Fastener heads and accessories shall be covered with 2 separate coats of joint compound.
  - c. Joint compound shall be smooth and free of tool marks and ridges.
  - d. Surface to be coated with Drywall Primer as specified herein prior to application of texture.
  - e. Untextured surfaces to be coated with Drywall Primer prior to application of final finishes as specified in Sections 09900 and 09950, as applicable.
5. Level 4 (Appearance areas to receive flat paints, light texture, or where backed wallcoverings are to be applied. This level of finish is not to be used where gloss, semi-gloss and enamel paints are to be applied.):
  - a. Joints and interior angles shall have tape embedded in joint compound and 2 separate coats of joint compound applied over flat joints and one separate coat of joint compound applied over interior angles.
  - b. Fastener heads and accessories shall be covered with 3 separate coats of joint compound..
  - c. Joint compound shall be smooth and free of tool marks and ridges.
  - d. Surface to be coated with Drywall Primer as specified herein prior to application of texture.
  - e. Untextured surfaces to be coated with Drywall Primer prior to application of final finishes as specified in Sections 09900 and 09950, as applicable.
6. Level 5 (Appearance areas to receive gloss, semi-gloss, enamel, or nontextured flat paints or where severe lighting conditions occur.):
  - a. Joints and interior angles shall have tape embedded in joint compound and 2 separate coats of joint compound applied over flat joints and one separate coat applied over interior angles.
  - b. Fastener heads and accessories shall be covered with 3 separate coats of joint compound.

- c. A thin skim coat of joint compound, or a material manufactured especially for this purpose, shall be applied to the entire surface to fill imperfections in the joint work, smooth the paper texture and provide a uniform surface for decorating. Excess compound shall be immediately sheared off, leaving a film of skim coating compound completely covering the paper.
  - d. The surface shall be smooth and free of tool marks and ridges.
  - e. Surface to be coated with Drywall Primer as specified herein prior to application of texture.
  - e. Untextured surfaces to be coated with Drywall Primer prior to application of final finishes as specified in Sections 09900 and 09950, as applicable.
- B. Surfaces shall be free of dust, dirt and oil and shall received Drywall Primer before application of texture or skim coat as required by the manufacturer of the texture or skim coat materials.
- C. Textured Finish: Produce textured finish to match approved sample, type as indicated below.  
Smooth

### 3.06 CLEANING

- A. After completion of wallboard installation, taping and texturing, remove rubbish, excess material and equipment from building and job site, leaving floors and other surfaces clean.
- B. Remove overspray from adjoining construction.
- C. During the course of the Work and on completion of the Work, remove excess materials, equipment and debris and dispose of away from premises. Leave Work in clean condition in accordance with Section 01500.

### 3.07 PROTECTION

- A. Protect Work from damage until acceptance.
- B. Repair or replace damaged Work.

END OF SECTION

## SECTION 09900

### PAINTING

#### PART 1 GENERAL

##### 1.01 SUMMARY

- A. Section Includes: Painting as specified and as noted on Drawings. Surfaces requiring finishing and left unfinished by the requirements of other Sections shall be painted or finished as part of the Work of this Section.

##### 1.02 DEFINITIONS

- A. Touch-Up: Painting of items missed by painter at no additional cost to Owner.
- B. Re-Paint: Repairs to paint work for damages caused by other trades.

##### 1.03 SUBMITTALS

- A. Product Data: Submit schedule of manufacturers of products required for the Work, together with specifications recommended by each manufacturer.
- B. Samples: Submit samples of each type of finish specified.
  - 1. Architect will furnish Contractor a color schedule of colors selected either from manufacturer's stock colors or specially requested color mixes before Work is begun.
  - 2. Submit two 8 inch x 10 inch (200mm x 250mm) samples of each color, including the correct sheen and texture, on heavy cardboard or masonry. Submit sealer and stain finishes on material or the same quality and species of wood on which that particular finish shall be used. Rejected samples shall be resubmitted until approved.
  - 3. Samples shall be submitted at least 30 days prior to the start of painting work. Label and identify each sample as to location and application. Upon submittal of color samples, minor variations or changes in color selection may be requested by the Architect and new samples ordered, until final color approval.

##### 1.04 QUALITY ASSURANCE

- A. Standards: Preparation, application and workmanship shall be in accordance with manufacturer's recommendations and applicable provisions of the following:
  - 1. Painting and Decorating Contractors of America (PDCA) "Painting Specification Manual" and "Standards".
    - a. PDCA P1-92, "Touch-Up Painting and Damage Repair - Financial Responsibility." A properly painted surface shall be as defined in this Standard.
    - b. PDCA P2-92, "Third Party Inspection Qualifications and Responsibilities."
    - c. PDCA P3-93, "Designation of Paint Colors."
    - d. PDCA P4-94, "Responsibilities for Inspection and Acceptance of Surfaces Prior to Painting and Decorating."
    - e. PDCA P5-94, "Benchmark Sample Procedures for Paint and Other Decorative Coating Systems."
    - f. AZP-P07-89, "Technical Paper - Arizona Council."
  - 2. Gypsum Association - GA210, "Gypsum Board for Walls and Ceilings."

#### 1.05 DELIVERY, STORAGE, AND HANDLING

- A. Packing and Shipping: Deliver materials to site in manufacturer's sealed containers, legends and labels, intact.
- B. Storage:
  - 1. Adequately protect against damage while stored at site.
  - 2. In no case shall the amount or method of materials stored exceed the amount permitted or the manner allowed by local ordinances, state laws, or fire underwriter regulations.

#### 1.06 PROJECT/SITE CONDITIONS

- A. Environmental Requirements: Do not apply exterior paint in damp or rainy weather or until after the surface has dried thoroughly from the effects of such weather.
  - 1. Do not apply varnish or paint when temperature is below 50 degrees F. (10 degrees C.). Avoid painting surfaces exposed to hot sunlight.
  - 2. During interior application, maintain minimum temperature of 65 degrees F. (18 degrees C.) unless otherwise directed by Architect or manufacturer's printed instructions. Hold temperature as constant as possible.
  - 3. Provide adequate ventilation at all times so the humidity cannot rise above the dew point of the coldest surface to be painted.
  - 4. Moisture-containing surfaces, such as concrete, stucco and cement plaster shall have a moisture content of less than 8 percent as measured by moisture meter. Remove surface salt deposits prior to painting. Verify that pH is neutral, or within acceptable limits of Paint Manufacturer. Paint after thoroughly cured.

#### 1.07 MAINTENANCE

- A. Extra Materials: Upon completion of the Work, furnish Owner with one fresh gallon of each type and color of paint and finish used on this Project. Label containers with manufacturer's name, batch, color, shelf life, instructions, and cautions.

### **PART 2 PRODUCTS**

#### 2.01 MANUFACTURERS

- A. Furnish products of one of the following manufacturers, except as otherwise approved by Architect, subject to compliance with specification requirements.
  - 1. Dunn-Edwards Corporation (Arizona Representative: Tim Garver, 602/968-3413, ext. 3221).
  - 2. Frazee Industries (Arizona Representative: Al Kuhns, 602/275-5444).
  - 3. ICI (Arizona Representative: Marv Nance, 602/784-4000).
  - 4. PPG (Arizona Representative: James Hicks, 602/956-1150).
  - 5. Sherwin Williams (Arizona Representative: Jackie Jordan, 1-888-365-6042)
  - 6. Tnemec (Arizona Representative: Teri Lundquist, 602/951-8686).

2.02 MATERIALS

- A. Provide materials in accordance with Section 09901 - Schedule of Paint Products as applicable to project and as scheduled herein under Part 3 - Execution. Contractor shall provide either waterborne or solventborne products at contractor's option and as follows:
  - 1. Waterborne:
    - a. Provide where low odor and fast dry are desired.
    - b. Non-blocking materials shall be used for doors, door jambs, railings and other locations subject to handling, or where surfaces will come into contact with other painted surfaces or belongings.
  - 2. Solventborne:
    - a. Provide where harder finish is required (such as "wet" areas) and odor will not create problems with occupants.
    - b. These products shall not be used where color retention is a concern. Verify with Architect.
  - 3. Materials used shall comply with applicable Federal and local air pollution regulations, lead content laws, and current VOC requirements. If products listed in Section 09901 are not in compliance with regulations, laws, or requirements, Contractor shall notify Architect and shall provide information regarding substitute products.
- B. Basic painting materials such as linseed oil, shellac, turpentine, thinners, driers, and other similar products, shall be of highest quality, made by reputable, recognized manufacturers, and have identifying labels on containers. Paint materials shall be factory fresh.
- C. Materials shall be "top of the line, first quality" products. "Professional Lines" are not to be provided unless no other product is available for use. Alternate materials submitted for prior approval shall have qualities and materials equal to the other listed manufacturer's top of the line, first quality products. Materials selected for coating systems for each type of surface shall be the products of a single manufacturer.
- D. Standard Gloss Range: Provide paints in accordance with the following ranges in accordance with ASTM D523 and in accordance with Finish Schedules on drawings:

<u>Sheen</u>	<u>Geometry</u>	<u>Gloss Range</u>
Flat	85 degree	Below 15 (see also Paint Finishes herein)
Eggshell	60 degree	5-20
Lo Luster	60 degree	15-25
Satin	60 degree	15-35
Semi-Gloss	60 degree	30-65
Gloss	60 degree	Over 65
- E. Paints shall be ready mixed except for field catalyzed coatings.

**PART 3 EXECUTION**

3.01 EXAMINATION

- A. Verification of Conditions: Examine subsurfaces to receive Work and report in writing with a copy to Architect, conditions detrimental to Work. Commencement of Work will be construed as acceptance of subsurfaces.

### 3.02 PROTECTION

- A. Before painting, remove hardware, accessories, electrical plates, lighting fixtures and similar items. Provide protection for such items, including adjacent surfaces as required or directed.
  - 1. On completion of each space, replace above items.
  - 2. Mask permanent labels.
  - 3. Provide, distribute, and maintain a sufficient supply of clean drop cloths and other protective coverings.

### 3.03 SURFACE PREPARATION

- A. General:
  - 1. Surfaces requiring painting or finishing shall be thoroughly dry and cured, free of dirt, dust, grease, oil and other foreign matter. Repair voids, cracks, nicks, and other surface defects, with appropriate patching material. Finish flush with surrounding surfaces.
  - 2. Spot prime marred or damaged shop coats on metal surfaces with appropriate metal primer.
  - 3. Determine moisture content of plaster, stucco, cementitious materials, wood, and other moisture-holding materials by use of a reliable electronic moisture meter.
- B. Wood:
  - 1. Sandpaper to smooth and even surface and then dust off. After primer or stain coat has been applied, thoroughly fill nail holes and other surface imperfections with putty tinted with primer or stain to match wood color. Sand woodwork between coats to a smooth surface. Cover knots and sap streaks with a thin coat of shellac.
  - 2. Finish door and window edges after final fitting. Finish interior of cabinets in the same manner as the exterior unless otherwise specified. Seal interior of drawers unless otherwise specified.
  - 3. Backpriming:
    - a. Backprime exterior woodwork, which is to receive paint finish, with exterior primer paint.
    - b. Backprime interior woodwork, which is to receive paint or enamel finish, with enamel undercoater paint.
    - c. Backprime interior and exterior woodwork, which is to receive stain and/or varnish finish with VOC compliant varnish acceptable to the Architect.
    - d. Back-prime wood trim before installation.
- C. Steel and Iron:
  - 1. Remove grease, rust and rust scale and touch-up chipped or abraded places on items that have been shop coated.
  - 2. When area will be exposed to view, sandpaper the entire treated area smooth, feather the edge of surrounding undamaged prime coat and spot prime in a manner to eliminate evidence of repair.
  - 3. Where steel or iron at existing Work have a heavy coating of scale, remove by sand blasting, sanding, descaling, grinding or wire brushing, as necessary, to produce a satisfactory surface for painting.
- D. Galvanized Metal and Aluminum:
  - 1. Thoroughly clean by wiping surfaces with solvent. Apply surface conditioner or vinyl-wash pretreatment. Prime galvanized metal with galvanized iron primer as recommended by paint manufacturer. A test sample of the complete painting system should be applied and checked for adhesion before final painting begins.
  - 2. Clean visible portions of throats of galvanized steel ductwork with solvent; wipe dry with clean rags and paint flat black.

- E. Concrete:
  1. The method of surface preparation shall be at Contractor's discretion, provided the results are satisfactory to the Architect, and method is in compliance with applicable codes and requirements.
  2. Before first paint coat is applied, spot prime nails and other exposed metal occurring in the surfaces with a rust inhibitive primer as recommended by paint manufacturer.
  3. Prepare concrete surfaces to be painted by removing dirt, dust, oil and grease stains and efflorescence.
  
- F. Plaster and Gypsum Board Surfaces:
  1. Fill cracks, holes or imperfections in with compatible patching material and smooth off to match adjoining surfaces. Before painting, surfaces shall be first tested for dryness with a moisture testing device.
  2. Apply no paint or sealer on gypsum board or plaster when the moisture content exceeds 8 percent. Test sufficient areas in each space and as often as necessary to determine if the surface has the proper moisture content for painting. If the moisture content is between 8 percent and 12 percent, prime with alkali resistant primer.
  3. If 8 percent or less, prime with specified primer. Remove the dry salt deposits from plaster surfaces by brushing with a stiff brush before painting.
  
- G. Existing Surfaces:
  1. Clean, sand, patch, repair, and prepare existing surfaces to be painted so that such existing finished surfaces are indistinguishable from new surfaces.
  2. Surfaces which cannot be prepared or painted as specified shall be immediately brought to the attention of the Architect in writing.

### 3.04 WORKMANSHIP

- A. Apply products to achieve paint manufacturer's printed specifications for dry mil thickness
- B. Apply each coat of paint evenly and comply with manufacturer's drying time before applying subsequent coats.
- C. Finished work shall be uniform, of approved color, smooth and free from runs, sags, clogging or excessive flooding. Make edges of paint adjoining other materials or colors sharp and clean, without overlapping. Where varnishes or enamel is used, lightly sand dust and clean undercoats to obtain a smooth finish coat. Sand carefully between each coat of finish on smooth surfaces for good adhesion of subsequent coats.
- D. Where clear finishes are required, ensure tinted fillers match wood. Work fillers well into the grain before set. Wipe excess from the surface.
- E. Where specific mil thicknesses are required, check thickness by the following methods:
  1. Over ferrous metal - Elecometer Film Gauge
  2. Other surfaces - Tooke Dry Mil Inspection Gauge

### 3.05 APPLICATION

- A. The number of coats scheduled is the minimum number of coats required. Additional coat(s) shall be applied, at no additional cost to the Owner, to completely hide base material, provide uniform color and to produce satisfactory finish results.
- B. Apply coatings without thinning except as specifically required by label directions, or required by these specifications. In such cases, thinning shall be the minimum reduction permitted.
- C. Priming will not be required on items delivered with prime or shop coats, unless otherwise specified. Touch up prime coats applied by others as required to ensure an even primed surface before applying finish coat.
- D. Plumbing, Mechanical and Electrical:

1. Exterior and interior exposed water, gas, waste piping, sprinkler piping, conduit, lighting and electrical panels, telephone terminal boxes, galvanized ducts and insulated ducts, shall be painted in areas other than mechanical rooms, unless otherwise scheduled.
  2. Paint exposed unfinished fixtures, metal ducts, switch boxes, control panels, devices, starters, junction boxes, vents, drains, and other similar items, as directed by Architect.
- E. Spray paint prime coated (not pre-finished) grilles and registers with enamel or lacquer to match walls and ceilings. Paint materials shall not sag, run or bind movable parts of grilles, registers, louvers, baffles, and other similar items.
1. Throats of ducts shall be given one coat of flat black paint, wherever visibility of the interior of the duct is allowed through registers or other similar items. At fiber lined duct, use black latex paint.
  2. Examine the Mechanical and Electrical Drawings and Specifications to determine the amount of exposed work to be painted.
- F. Paint exposed surfaces of every member; paint items inaccessible after installation before installation, if required to be painted. Edges, tops, and bottoms of wood doors shall be sealed and finished with the same finish as the door faces, to meet door manufacturer's warranty requirements. Verify edge color with Architect as different colors may be selected for each face.
- G. Paint items fitted with finish hardware after hardware has been temporarily removed.
- H. Heating and other equipment on or adjacent to walls or surfaces scheduled for painting, shall be disconnected, using workmen skilled in appropriate trades, and moved temporarily to permit painting of surface. Following completion of painting, replace and reconnect items.
- I. Each succeeding pigmented coat shall be distinguishably lighter than the previous coat. Tint prime and undercoats to a color similar to finish coat. Each coat of material applied must be inspected and approved by the Architect before the application of the succeeding specified coat; otherwise no credit for the concealed coat will be given, and the Contractor shall assume the responsibility to recoat work in question. Contractor shall notify the Architect when each coat is completed.
- J. Brush, wipe or roll stain in 2 coat application. Avoid lap marks by maintaining "wet-edge" continually being merged with existing liquid coverage and stop only at natural edges, turns and breaking places.
- K. Do not paint over Underwriters' Laboratory labels, fusible links, exposed sprinkler heads, and other similar items.
- L. Paint piping, electrical or other equipment, conduit, vents, and other similar items, on roof or other exterior locations as directed by Architect.
- M. Finish closets and the interior of cabinets with same color as adjoining rooms, unless otherwise specified. Finish other surfaces same as nearest or adjoining surfaces, unless otherwise shown or scheduled.
- N. Paint surface of walls which will be concealed by cabinets, chalkboards and other items attached to wall.
- 3.06 ADJUSTING
- A. At completion, do touch-up and re-paint work and leave finish surfaces in good condition.

### 3.07 CLEANING

- A. During the course of the Work, remove misplaced paint and stain spots or spills. Leave Work in clean condition acceptable to Architect and in accordance with Section 01500.
- B. Remove oily rags and waste daily, taking precaution to prevent fire.

### 3.08 SCHEDULES

- A. Color Schedule:
  - 1. Architect will provide a complete schedule of colors. Colors may be selected from various manufacturer's color palettes. Manufacturer supplying paint shall match these colors. Contractor shall prepare duplicate set of samples of treatments for major surfaces. If a specific surface or item receiving a paint finish does not have a specific color indicated or selected by the Architect, obtain clarification from the Architect. Do not assume the confirmation of the same color on the adjacent surfaces.
  - 2. Final coat of paint shall be not be applied until colors have been approved by the Architect.
- B. Schedule of Finishes: Refer to the "Finish Schedule" on the Drawing for designated finishes of areas.
- C. Finishing of the following listed items and materials will not be required and shall be protected:
  - 1. Stainless Steel, brass, bronze, copper, monel, chromium, anodized aluminum; specially finished articles such as porcelain enamel, plastic coated fabrics, and baked enamel, unless otherwise indicated.
  - 2. Finished products such as ceramic tile, glass, brick, resilient flooring and acoustical tiles, board and metal tees.
  - 3. Pre-finished products such as wood folding partitions and doors, wood classroom and laboratory casework, bleachers and elevator cabs.

### 3.09 INTERIOR PAINT FINISHES

- A. This schedule uses the generic names listed in Section 09901 - Schedule of Paint Products.
- B. System 201 (Ferrous Metals): Apply to exposed metals such as steel doors, hollow metal frames, metal beam saddles, columns, grilles and registers, stair and hand railings, ladders, and other exposed miscellaneous metals.
  - 1. 1st Coat: Ferrous Metal Primer (Red or White, color as applicable to finish coats.)
  - 2. 2nd Coat: Enamel Undercoater/Primer or same material as 3rd Coat as recommended by manufacturer.
  - 3. 3rd Coat:
    - a. Eggshell: Enamel, Eggshell.
    - b. Semi-Gloss (if noted on Drawings): Enamel, Semi-Gloss.
    - c. Gloss (if noted on Drawings): Enamel Gloss.
- C. System 202 (Interior Wood Finishes - Enamel): Apply to wood door frames, columns, exposed and concealed casework and millwork, wood-window wall construction, medium density plywood surfaces, shelving, roll-up wood doors, perforated and plain type hardboard, particleboard and other exposed miscellaneous wood and trim, except wood specified for a transparent or stain finish.
  - 1. 1st Coat: Enamel Undercoater/Primer.

2. 2nd and 3rd Coat:
  - a. Eggshell: Enamel, Eggshell
  - b. Semi-Gloss (if noted on Drawings): Enamel, Semi-Gloss
  - c. Gloss (if noted on Drawings): Enamel, Gloss
  
- D. System 203 (Interior Wood Finish - Flat): Apply to plywood telephone backing boards and other miscellaneous softwood as noted, specified or scheduled.
  1. 1st Coat: Enamel Undercoater/Primer.
  2. 2nd and 3rd Coat: Paint, Flat - Waterborne (Vinyl Acrylic)
  
- E. System 204 (Galvanized Metals): Apply to exposed galvanized metal.
  1. Solvent clean metal to remove foreign matter or any coating applied by the metal manufacturer. Apply Surface Conditioner or Vinyl Wash Pretreatment (if required by paint manufacturer)
  2. 1st Coat: Galvanized Metal Primer
  3. 2nd and 3rd Coats:
    - a. Eggshell: Enamel, Eggshell
    - b. Semi-Gloss (if noted on Drawings): Enamel, Semi-Gloss
    - c. Gloss (if noted on Drawings): Enamel Gloss
  
- F. System 205 (Aluminum): Apply to interior louvers and other miscellaneous exposed unfinished aluminum surfaces.
  1. Solvent clean metal to remove foreign matter or any coating applied by the metal manufacturer.
  2. 1st Coat: Aluminum Primer
  3. 2nd and 3rd Coats:
    - a. Eggshell: Enamel, Eggshell
    - b. Semi-Gloss (if noted on Drawings): Enamel, Semi-Gloss
    - c. Gloss (if noted on Drawings): Enamel, Gloss
  
- G. System 206 (Gypsum Board, Plaster and Concrete - Wet Areas): Apply to gypsum board, plaster and concrete surfaces in toilet rooms, janitor rooms, kitchens, and other areas as scheduled.
  1. 1st Coat: Enamel Undercoater/Primer - Solventborne, unless noted otherwise.
  2. 2nd and 3rd Coats:
    - a. Eggshell (if noted on Drawings): Enamel, Eggshell - Solventborne.
    - b. Semi-Gloss: Enamel, Semi-Gloss - Solventborne or Enamel, Gloss - Solventborne (Epoxy-Polyester).
  
- H. System 207 (Gypsum Board, Plaster and Concrete - Non-Wet Areas): Apply to gypsum board, plaster and concrete except for wet areas.
  1. 1st Coat: Primer/Sealer. Primer/Sealer - Solventborne (Alkyd) shall be used at new untextured smooth gypsum board surfaces covered with powdery or unstable soft top joint cement.
  2. 2nd and 3rd Coat:
    - a. Eggshell: Enamel, Eggshell
    - b. Semi-Gloss (if noted on Drawings): Enamel, Semi-Gloss
    - c. Flat (if noted on Drawings): Paint, Flat
  
- I. System 208 (Ferrous Metal - Chemical Resistant Finish): NOT USED
  
- M. System 212 (Acoustic Ceilings): Apply to existing acoustic tile or board.
  1. 1st and 2nd Coat: Acoustic Paint.

### 3.11 CLEAR WOOD FINISHES

- A. This schedule uses the generic names listed in Section 09901 - Schedule of Paint Products.
  
- B. System 301 (Stained with Clear Finish): Apply to wood doors, handrails and chair rails. Fill open grain hardwood such as Oak.
  1. Clear Flat - Lacquer:

- a. 1st Coat: Semi-Transparent Stain - Solventborne (Oil)
    - b. 2nd Coat: Lacquer Sanding Sealer - Solventborne
    - c. 3rd Coat: Lacquer, Flat - Solventborne
  - 2. Clear Semi-Gloss - Waterborne Acrylic Urethane:
    - a. 1st Coat: Semi-Transparent Stain - Solventborne (Oil)
    - b. 2nd and 3rd Coat: Varnish, Satin (Low Sheen) - Waterborne (Acrylic Urethane)
  - 3. Clear Semi-Gloss - Lacquer
    - a. 1st Coat: Semi-Transparent Stain - Solventborne (Oil)
    - b. 2nd Coat: Lacquer Sanding Sealer - Solventborne
    - c. 3rd Coat: Lacquer, Semi-Gloss - Solventborne
  - 4. Clear Gloss - Waterborne Acrylic Urethane:
    - a. 1st Coat: Semi-Transparent Stain - Solventborne (Oil)
    - b. 2nd and 3rd Coat: Varnish, Gloss - Waterborne (Acrylic Urethane)
  - 5. Clear Gloss - Lacquer
    - a. 1st Coat: Semi-Transparent Stain - Solventborne (Oil)
    - b. 2nd Coat: Lacquer Sanding Sealer - Solventborne
    - c. 3rd Coat: Lacquer, Gloss - Solventborne
- C. System 302 (Transparent Stain Wax Finish): Apply to wood doors, handrails and chair rails. Fill open grain hardwood such as oak.
  - 1. 1st Coat:
    - a. Semi-Transparent Stain (Wiping)
    - b. Lacquer-Based Stain - Solventborne
  - 2. 2nd Coat: **Paste Wax** .

### 3.12 SCHEDULE OF PAINT PRODUCTS

- A. In accordance with Section 09901 - Schedule of Paint Products.
- B. Only those product which are specifically required by Section 09900 - Painting shall be provided. Products listed in Section 09901 that are not specified in Section 09900 are for information only.

END OF SECTION

**SECTION 010270**  
**ACCESS FLOORING**

**PART 1 GENERAL**

- 1.1 Section Includes  
A. Work of this section includes, but is not limited to: access floor panels, floor coverings, understructure and various electrical, data and communication accessories.
- 1.2 Related Sections  
A. Concrete sealer shall be compatible with pedestal adhesive, see Division 3.  
B. See Division 26 Section "Grounding and Bonding for Electrical Systems" for connection to ground of access flooring understructure. Note: The electrical engineer or contractor shall determine requirements for grounding and the electrical contractor shall provide the necessary labor and materials to electrically connect the access flooring to the building ground if it is required.
- 1.3 Environmental Conditions for Storage and Installation  
A. Area to receive and store access floor materials shall be enclosed and maintained at ambient temperature between 35  to 95  F and 80% relative. All floor panels shall be stored at ambient temperature between 50  to 90  F for at least 24 hours before installation begins. All areas of installation shall be enclosed and maintained at ambient temperature between 50  to 90  F and humidity level between 20% to 80%, and shall remain within these environmental limits throughout occupancy.
- 1.4 References  
A. CISCA (Ceilings & Interior Systems Construction Association) - "Recommended Test Procedures for Access Floors" shall be used as a guideline when presenting load performance product information.
- 1.5 Performance Certification  
A. Product tests shall be witnessed and certified by independent engineering and testing laboratory based in the U.S. with a minimum of five years experience testing access floor components in accordance CISCA "Recommended Test Procedures for Access Floors".
- 1.6 Country-of-Origin and Product Marking  
A. Access floor materials shall comply with the provisions outlined in FAR Subpart 25.2 – Buy American Act – Construction Materials.  
B. Floor panels shall be permanently marked with manufacturer's name, product identification, manufacturing date and country-of-origin. Removable Product ID stickers are not acceptable.
- 1.7 Performance Requirements  
A. Design Load (Allowable Load): Panel supported on actual understructure system shall be capable of supporting a load point of 1000 lbs. applied on one square inch area at any location on the panel without experiencing permanent set as defined by CISCA. The loading method used to determine design (allowable) load shall be in conformance with CISCA Concentrated Load test method but with panel tested on actual understructure instead of steel blocks.  
B. Safety Factor: Panel supported on actual understructure system shall withstand a point load of no less than (2) two times its design load rating on a one square inch area anywhere on the panel without failure when tested in accordance with CISCA A/F, Section 2, "Ultimate Loading". Failure is defined as the point at which the system will no longer accept the load.  
C. Ultimate Load: Panel supported on actual understructure system shall be capable of supporting a point load of at least 2000 lbs. applied through a load indenter on a one square inch area at any location on the panel without failure (i.e. minimum safety factor if 2) when tested in accordance with CISCA A/F, Section 2, "Ultimate Loading".  
D. Rolling Load: Panel supported on actual understructure system shall be able to withstand the following rolling loads at any location on the panel without developing a local and overall surface deformation greater than 0.040 inches when tested in accordance with

CISCA A/F Section 3, "Rolling Loads". Note: wheel 1 and wheel 2 tests shall be performed on two separate panels.

CISCA Wheel 1: Size: 3" dia x 1 13/16" wide Load: 400 lbs. Passes:10

CISCA Wheel 2: Size: 6" dia x 2" wide Load: 400 lbs. Passes:10,000

- E. Impact Load: Panel and supporting understructure (the system) shall be capable of supporting an impact load of 150 lbs. dropped from a height of 36 inches onto a one square inch area (using a round or square indenter) at any location on the panel when tested in accordance with CISCA A/F, Section 8, "Drop Impact Load Test".
- F. Panel Drop Test: Panel shall be capable of being dropped face up onto to a concrete slab from a height of 36", after which it shall continue to meet all load performance requirements as previously defined.
- G. Panel Cutout: Panel with an 8" diameter interior cutout supported on actual understructure shall be capable of maintaining its design load strength with a minimum safety factor of 2 anywhere on the panel without the use of additional supports.
- H. Flammability: System shall meet Class A Flame spread requirements for flame spread and smoke development. Tests shall be performed in accordance with ASTM-E84-1998, Standard Test Method for Surface Burning Characteristics for Building Materials.
- I. Combustibility: All components of the access floor system shall qualify as non-combustible by demonstrating compliance with requirements of ASTM E 136, Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750 deg C.
- J. Recycled Content: Panel and understructure system shall be required to have a minimum post-consumer recycled content of 18% and a minimum total recycled content of 49%.
- K. Axial Load: Pedestal support assembly shall provide a 6000 lb. axial load without permanent deformation when tested in accordance with CISCA A/F, Section 5, "Pedestal Axial Load Test".
- L. Overturning Moment: Pedestal support assembly shall provide an average overturning moment of 1000 in-lbs. when glued to a clean, sound, uncoated concrete surface when tested in accordance with CISCA A/F, Section 6, "Pedestal Overturning Moment Test". ICBO number for the specific system or structural calculations shall be required attesting to the lateral stability of the system under seismic conditions.
- M. Stringer Concentrated Load: Stringer shall be capable of withstanding a concentrated load of 450 lbs. placed in its midspan on a one square inch area using a round or square indenter without exceeding a permanent set of 0.010" after the load is removed when tested in accordance with CISCA A/F, Section 4, "Stringer Load Testing".

1.8 Design Requirements:

- A. Access floor system, where indicated on the design documents, shall consist of modular and removable welded steel panels supported on all four edges by structural steel members which are designed to bolt onto adjustable height pedestal assemblies forming a modular grid pattern.
- B. Panel shall be easily removed by one person with a suction cup lifting device and shall be interchangeable except where cut for special conditions.
- C. Quantities, finished floor heights (FFH) and location of accessories shall be as specified on the contract drawings.

1.9 Submittals for Review

- A. Detail sheets, for each proposed product type, which provide the necessary information to describe the product and its performance.
- B. Test reports, by an independent testing laboratory, certifying that component parts perform as specified.

1.10 Submittals for Information

- A. Manufacturer's installation instructions and guidelines.
- B. Manufacturer's Owner Manual outlining recommended care and maintenance procedures.

PART 2 – PRODUCTS

2.1 Manufacturers

- A. Access floor system shall be by Tate Access Floors, Inc. and shall consist of the ConCore® ICSF 1500 access floor panel supported by the bolted stringer understructure system.
- B. Alternative products shall meet or exceed all requirements as indicated herein and must receive prior written approval by the architect or designer.

- C. Access floor manufacture shall be ISO9001: 2000 certified demonstrating it has a robust and well documented quality management system with continuous improvement goals and strategies.
- D. Access floor manufacturer's facilities shall be ISO14001:2004 certified demonstrating that they maintain an environmental management system.
- E. Access floor manufacturer's facilities shall be OHSAS 18001:2007 certified demonstrating that they maintain an Occupational Health and Safety Management system.

## 2.2 Support Components

### Pedestals:

- A. Pedestal assemblies shall be corrosive resistant, all steel welded construction, and shall provide an adjustment range of +/- 1" for finished floor heights 6" or greater. Zinc electroplating shall be prohibited on all pedestal components, including head plate, threaded rod, adjustment nut, pedestal tube, base plate, and all fasteners.
- B. Pedestal assemblies shall provide a means of leveling and locking the assembly at a selected height, which requires deliberate action to change height setting and prevents vibration displacement.
- C. Hot dip galvanized steel pedestal head shall be welded to a threaded rod that includes a specially designed adjusting nut. The nut shall provide location lugs to engage the pedestal base assembly, such that deliberate action is required to change the height setting.
- D. Threaded rod shall provide a specially designed anti-rotation device, such that when the head assembly is engaged in the base assembly, the head cannot freely rotate (for FFH of 7" or greater and Types 1A, 2B and 3B square tube bases only). Note: This prevents the assembly from inadvertently losing its leveling adjustment when panels are removed from the installation during use.
- E. Hot dip galvanized pedestal base assembly shall consist of a formed steel plate with no less than 16 inches of bearing area, welded to a 7/8" square steel tube and shall be designed to engage the head assembly.

### Stringer:

- A. Stringers shall support each edge of panel.
- B. Stringer shall have conductive galvanized coating. Zinc electroplating shall be prohibited on stringers and stringer fasteners.
- C. Stringers shall be individually and rigidly fastened to the pedestal with one machine screw for each foot of stringer length. Bolts shall provide positive electrical contact between the stringers and pedestals. Connections depending on gravity or spring action are unacceptable.
- D. Stringer grid shall be 4' stringers in a basketweave configuration ensuring maximum lateral stability in all directions. (Also available in 2' x 4' and 2' x 2' grid patterns).

## 2.3 Panel Components

### Floor Panels:

#### ConCore ICSF Floor Panel:

- A. Panels shall consist of a top steel sheet welded to a formed steel bottom pan filled internally with a lightweight cementitious material. Mechanical or adhesive methods for attachment of the steel top and bottom sheets are unacceptable.
- B. Cementitious fill material shall be totally encased within the steel welded shell except where cut for special conditions.
- C. Panel shall have a total of 120 welds; comprising 64 internal and 56 perimeter welds to ensure structural integrity.
- D. Panel shall be protected from corrosion by a powder paint finish.

#### GrateAire Panels:

- A. Die cast aluminum grate panels designed for static and rolling loads shall be interchangeable with standard field panels. Grate panels shall have 56% open area with the following air distribution capability without a damper: 2096 cfm at 0.1-inch of H<sub>2</sub>O (static pressure). Grate panels shall have the following load bearing capacities:

- B. Design Load: Panel supported on actual understructure shall be capable of supporting a safe working or design load of 1000 lbs. placed on a one square inch area, using a round or square indenter, at any location on the panel without yielding.
- C. Safety Factor: (2) Times Design Load
- D. Rolling Load: Grate panel and supporting understructure shall be able to withstand the following rolling loads at any location on the panel without developing a local and overall surface deformation greater than 0.040 inches. Note: wheel 1 and wheel 2 tests shall be performed on two separate panels.  
 Wheel 1:           Size: 3" dia x 1 13/16" wide       Load: 1000 lbs. Passes:10  
 Wheel 2:           Size: 6" dia x 2" wide       Load: 800 lbs.       Passes:10,000
- E. Impact load: 100 lbs.

2.4 Accessories

- A. Air sealing grommet shall be installed in the interior or on the edge of a factory placed cutout located in the one of the two following position in the panel.
  - 1. OPTION A (Interior Cutout)
    - a) 4.075" from the left edge of the panel
    - b) 7.375" from the top and bottom edge of the panel
    - c) The cutout in the panel shall measure 6.75"x9.25" and shall be a punched penetration, saw cutting is not acceptable
    - d) The cutout location shall allow the air sealing grommet to be located in such a way that regardless of rack position or overall dimensions, that the unit will be position beneath the rack allowing for cable penetrations to enter the rack footprint.
  - 2. Provide manufacturer's standard steps, fascia plate, perimeter support, and grommets where indicated on the contract drawings.
  - 3. Provide 5 spare floor panels and 10 square feet of understructure systems for each type used in the project for maintenance stock. Deliver to project in manufacturer's standard packaging clearly marked with the contents.
  - 4. Provide 2 panel lifting devices.
  - 5. When applicable provide manufacturer's standard underfloor air systems components (including, grilles, diffusers and perforated floor panels) where indicated on the contract drawings.

2.5 Finishes

- A. Surface to Ground Resistance of Standard High Pressure Anti-Static Laminate Covering: Average test values shall be within the range of 1,000,000 ohms (1.0 x 10<sup>6</sup>) to 20,000 megaohms (2.0 x 10<sup>10</sup> ohms), as determined by testing in accordance with the test method for conductive flooring specified in Chapter 3 of NFPA 99, but modified to place one electrode on the floor surface and to attach one electrode to the understructure. Resistance shall be tested at 500 volts.

2.6 Fabrication Tolerances

- A. Floor panel flatness measured on a diagonal: +/- 0.035"
- B. Floor panel flatness measured along edges: +/- 0.025"
- C. Floor panel width or length of required size: +/- 0.010"
- D. Floor panel squareness tolerance: +/- 0.015"

PART 3 - EXECUTION

3.1 Preparation

- A. Examine structural subfloor for unevenness, irregularities and dampness that would affect the quality and execution of the work. Do not proceed with installation until structural floor surfaces are level, clean, and dry as completed by others.
- B. Concrete sealers, if used, shall be identified and proven to be compatible with pedestal adhesive. Verify that adhesive achieves bond to slab before commencing work.
- C. Verify dimensions on contract drawings, including level of interfaces including abutting floor, ledges and doorsills.
- D. The General Contractor shall provide clear access, dry subfloor area free of construction debris and other trades throughout installation of access floor system.

- E. Area to receive and store access floor materials shall be enclosed and maintained at ambient temperatures between 35  level  between 20 to humid 80%. At least 24 hrs. before installation begins, all floor panels shall be stored at ambient temperatures between 50  to 90  F and shall remain within these environmental limits throughout occupancy.

3.2 Installation

- A. Pedestal locations shall be established from approved shop drawings so that mechanical and electrical work can be installed without interfering with pedestal installation.
- B. Installation of access floor shall be coordinated with other trades to maintain the integrity of the installed system. All traffic on access floor shall be controlled by access floor installer. No traffic but that of access floor installers shall be permitted on any floor area for 24 hours to allow the pedestal adhesive to set. Access floor panels shall not be removed by other trades for 72 hours after their installation.
- C. Floor system and accessories shall be installed under the supervision of the manufacturer's authorized representative and according to manufacturer's recommendations.
- D. No dust or debris producing operations by other trades shall be allowed in areas where access floor is being installed to ensure proper bonding of pedestals to subfloor.
- E. Access floor installer shall keep the subfloor broom clean as installation progresses.
- F. Partially complete floors shall be braced against shifting to maintain the integrity of the installed system where required.
- G. Additional pedestals as needed shall support panels where floor is disrupted by columns, walls, and cutouts.
- H. Understructure shall be aligned such that all uncut panels are interchangeable and fit snugly but do not bind when placed in alternate positions.
- I. Finished floor shall be level, not varying more than 0.062" in 10 feet or 0.125" overall.
- J. Inspect system prior to application of floor covering and replace any floor panels that are cracked, broken and structurally damaged and do not comply with specified requirements.
- K. Acceptance: General contractor shall accept floor in whole or in part prior to allowing use by other trades.

**END OF SECTION**

## SECTION 10401

### SIGNAGE

#### PART 1 GENERAL

##### 1.01 SUMMARY

- A. Section Includes: Furnish and install signs of size, material, images, arrangements, components and construction, and related work.

##### 1.02 SUBMITTALS

- A. General: Submit in accordance with Section 01300 - Shop Drawings, Product Data and Samples.
  - 3. Product Data: Submit 2 copies of manufacturer's specifications, recommendations and standard details for signage systems and components of the work.

##### 1.03 QUALITY ASSURANCE

- A. Manufacturer qualifications: Fabricate and install work of this Section using a manufacturer having a minimum of 5 years experience in this type of work and projects of this size. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
- B. Architect's approval: Do not make changes in visual elements without Architect's prior review and written approval.

##### 1.04 DELIVERY, STORAGE AND HANDLING

- A. Do not deliver signage to site until areas in which they are to be installed are ready to receive them.
- B. Deliver materials to site in as large fabrications as possible, protected from damage, in a manner to protect finishes. Store in appropriate location away from heavy traffic until time of installation. Handle carefully to avoid scratches and denting. Scratched or dented materials will be rejected.

##### 1.05 SCHEDULING AND COORDINATION

- A. Coordinate as required with other trades to assure proper and adequate provision in work of those trades for interface with the work of this Section. Coordinate schedules for installation of the work of this Section with schedules for other installations, to assure orderly progress of the total construction sequence.

##### 1.06 WARRANTY

- A. Preparation, primer, and finish coats shall be guaranteed for one year against pitting, peeling, or fading.

##### 1.07 MAINTENANCE

- A. Provide written instructions to Owner for proper maintenance of signs in accordance with Section 01700. Instructions shall address periodic cleaning, service access, painting, and replacement procedures prior to Substantial Completion.

#### PART 2 PRODUCTS

##### 2.01 MATERIALS AND COMPONENTS

- A. Materials shall be new stock, free from defects, imperfections strength, durability, and appearance. Provide materials as shown and detailed on drawings and as specified herein.
- B. Metals - General:
  - 1. For fabrication of exposed metal work, use only materials which are smooth and free of surface blemishes including pitting, roughness, seam marks, roller marks, and trade names.
  - 2. Do not use materials which have stains and discolorations.
  - 3. For exposed items of work which include plain flat surfaces in width of more than 50 times the metal thickness, provide sheet stock from mill which has been stretcher leveled to highest standard of flatness commercially available.
- C. Aluminum: Aluminum Association Alloy 5052H14 or as recommended to suit required service and finish.
  - 1. Aluminum in contact with steel other than non-magnetic stainless steel, shall have adequate protection to eliminate any possibility of electrolysis.
  - 2. Prime concealed aluminum surfaces in contact with masonry, concrete or plaster with even coat of alkali resistant asphaltum base paint.
- D. Steel rolled shapes: ASTM A36.
- E. Acrylics: As manufactured by Rohm & Haas, Acrylite or approved equal. Edges shall be free of saw marks, chips and be square to face. Edges are to be smooth and flame polished unless otherwise specified.
- F. Vinyl Die-Cut Characters: Pre-spaced [reflective] [matte finish] [glossy] die-cut letters of 3M ScotchCal film or Scotchlite in 3.5 mil thickness in typeface, spacing, and color noted on Drawings. Colors to be integral and not surface applied, unless otherwise noted. Paints, inks, dyes, and other materials used in the process shall be compatible and guaranteed not to cause discolorations, deterioration, or delamination.
- G. Adhesives: In accordance with recommendations made by manufacturer of material to be laminated or adhered. Adhesives that fade, discolor, or delaminate as a result of ultraviolet light or heat shall not be used. Adhesives shall be of non-staining and non-yellowing quality. Visible joints shall be free from air bubbles and other defects.
- H. Silicone Adhesives: Ready to use, high performance adhesive. General Electric GC 1200 sealant, translucent SCS 1201 or equal as recommended by manufacturer for bonding condition.
- I. Pin Mounts: Threaded studs 3/16" round minimum x 2" long minimum, unless heavier gauge pin mounts are required by size and weight of material to which it is applied.
- J. Paints: Non-fade, resistant to discoloration and delaminate as a result of ultraviolet light or heat. Exact identification of paints to be noted on shop drawings or paint sample submittal.
- K. Aluminum substrates: Two component polyurethane acrylic enamel (Polane or equal).
- L. Concrete substrates: Epoxy vinyl concrete paint to match specified colors.
- M. Silk screened acrylic signs: Quality exterior enamel ink.
- N. Weatherproofing: For exterior signs, provide additional protective coating to assure color integrity and abrasion resistance. Exterior structures which include hinged openings are to be sufficiently weatherproofed to prevent moisture, excessive dust, insects, and debris, from accumulating within interior cabinet areas which are exposed to exterior access.
- O. Other materials: Provide other materials, not specifically described but required for a complete and proper installation, as selected by Contractor subject to approval of Architect.

## 2.02 FABRICATION

- A. Provide signs as listed in Sign Schedule. Fabricate in accordance with reviewed Shop Drawings. Fabrication shall be in accordance with highest standards of trade. Signs and components shall be complete and free from visual and mechanical defects.
- B. Letters and signs shall be structurally designed by sign manufacturer as required to resist 30 psf wind loads or wind loads as required by Codes in effect at the location of the project, and thermal movements without distortions or excessive deflections. Letter and sign fabrication shall be a complete system including stiffeners, fasteners, welding, sealants, jointing, miscellaneous pieces and material thickness as required to form high quality workmanship. Connections, angles, shapes and details shown are suggestive and are to be sized, reinforced and detailed as required. Details not shown are to be equal to those detailed.
- C. No fabrication materials or procedures shall be used that will in any way change visual quality or in any manner have an adverse effect on existing materials or surfaces.
- D. In fabrication of metal pans in sign structures or individual letters "oil canning" surface appearance will not be acceptable.
- E. Shop assembly of component parts: Shop fabricate to maximum extent possible.
- F. Welding: Correct type to minimize permanent distortions of flat surfaces. Welding flux, oxides, and discolorations shall be removed by pickling or grinding, so that these areas match finish or adjacent areas. Any damage caused by fabrication must be repaired by grinding, polishing, or buffing.
- G. Aluminum Panels: Fabricate sign panels as detailed with corners neatly formed, edges smooth and free of sharp or other injurious surface. Exterior edges are to appear seamless and have continuous welds. Grind welds smooth and fill prior to priming and finish painting. Sand exposed surfaces smooth and chemically treat with alidine to seal aluminum. Shop prime surface per paint manufacturer's recommendation. Apply manufacturer's recommended thickness of polyurethane enamel. Paint as specified below.
- H. Fasteners: On sign-face surface of sign panels shall not be exposed. Sign face surfaces shall not be penetrated during fabrication or installation of signs. Sign-face surfaces shall not be deformed, distorted or discolored by attachment of concealed fasteners. Use 300 Series non-magnetic stainless steel fasteners for aluminum to aluminum and aluminum to steel. Blend fasteners with finish of system if fasteners are visible. Provide cadmium plated steel or equivalent when fasteners are used for steel to steel and steel to masonry construction. Miscellaneous fastening devices, and internal components shall be of aluminum, stainless steel, or zinc plated steel in accordance with ASTM A-164.
- I. Pin Mounts: Weld studs to sign plaques with no distortions or discolorations to sign-face. Minimum of four studs per plaque. Use epoxy adhesive where required in wall mounts. Receiving hole shall be 3/8" round minimum.
- J. Painting: Prime coats or other surface pretreatments, where recommended by manufacturer of paint, shall be included. Inks, paints and lacquers shall be evenly applied and without pinholes, scratches, orange peeling, application marks, etc. Provide standard matte finish for applicable sign surfaces not exceeding 25 degrees of gloss. Painted metal with glossy finish will not be acceptable.
- K. Applied Lettering and Graphics:
  - 1. Lettering shown on sign type drawings are intended as guidelines for layouts, type size and font face only.
  - 2. Complete copy text shall be in accordance with Sign Schedule with Typefaces/Arrows as scheduled.

3. Spelling and punctuation shall be correct. Should an error in spelling or punctuation be found, or spelling appear questionable, notify architect before proceeding.
  4. Sign type drawings and layout of copy contained within the schedule of graphics are based on scale calculations of the message lengths within given estimated sign areas. Should conflict arise in final message layout, notify Architect before proceeding.
  5. Align letterforms to maintain baseline parallel to sign format. Maintain margins as specified in sign type layouts.
  6. Typesetting: Must achieve proper letterforms and spacing as indicated on Drawings and shall be of quality equal to that produced by Arizona Typographers.
- L. Vinyl Die-Cut Characters: Prepare surfaces to receive characters with zylol or similar solvent before application, followed by water, rinse and through drying. Application of Letters to sign faces shall be square, plump, and true without bubbles or lifted edges. Perform die-cutting in such a manner that edges and corners of finished letterforms are true and clean. Letterforms with rounded positive or negative corners, nicked, cut or ragged edges, etc. will not be accepted.
- M. Silkscreens: To be executed from photoscreens or negatives. Pattern cut screens may be used where non repeat copy is required, copy mask equivalent to photo-screen quality. Contractor shall not use any images shown in the Contract Documents as "camera-ready artwork".

### **PART 3 EXECUTION**

#### **3.01 INSPECTION**

- A. Visit site with Architect to determine specific installation conditions and priorities. For exact installation locations for each sign, consult with Architect.
- B. Coordinate anchor details and materials with Architect. Notify Architect in writing of conditions detrimental to proper and timely installation of sign work.
- C. Inspect signs for evidence of damage at site prior to installation.
- D. Surface Conditions: Examine areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of Work. Do not proceed until unsatisfactory conditions are corrected.

#### **3.02 PREPARATION**

- A. Protection: Protect adjacent surfaces from damage during installation.
- B. Retain protective coverings intact and remove simultaneously from similarly finished items to preclude non-uniform oxidation and discoloration. Restore protective coverings which have been damaged during shipment or installation of work. Remove protective coverings only when there is no possibility of damage.

#### **3.03 INSTALLATION**

- A. Follow recommendations and instructions for installation as provided herein (or by manufacturer where instructions are provided). Notify Architect in writing if such installation will not provide permanent, rigid installation in existing conditions.
- B. Install sign units (and components at locations shown or scheduled), securely mounted with concealed, theft-proof fasteners. No exposed fasteners for installation are to be visible unless written approval is obtained from Architect. Attach signs to substrates in accordance with manufacturer's instructions. Provide anchorage and fitting coordinate location in field with Architect. Support signs until setting time of adhesive with foam tape or other mechanical means that does not damage surrounding surfaces.

- C. Install level, plumb, and at proper height. Repair or replace damaged units as directed by Architect. Coordinate and field measure proper location of sign units, where required, with Architect.
- D. Interface with Other Products: Coordinate sign locations with existing mechanical, electrical, plumbing and landscape elements and notify Architect in writing of any visual or physical conflicts. Coordinate installation of [concrete foundation], [masonry walls], [electrical connections], and [pads] with Contractor.
- E. Make final connections of illuminated signage from junction boxes located adjacent to signage. Materials for electrical shall be in accordance with the requirements of Section 16400, the National Electrical Code, and local codes.
- F. Securely mount signage in accordance with manufacturer's recommendations and as indicated, set plumb, level and true to line, without warp or rack.
- G. Sealants: Apply in one uniform, continuous bead.

#### 3.04 CLEANING

- A. At completion of work, adjust clean sign surfaces so they are free of residue and other foreign materials, leaving ready for use.

#### 3.05 DAMAGE AND REPAIR

- A. Repair: Promptly repair any damage to adjacent surfaces which occurred during installation.
- B. Touch up: Upon completion of installation, visually check exposed surfaces of work of this Section, and touch up scratches and abrasives to be completely invisible to unaided eye from a distance of five feet.

**END OF SECTION**

**SECTION 10520**  
**FIRE PROTECTION SPECIALTIES**

**PART 1 GENERAL**

1.01 SUMMARY

- A. Section Includes: Fire protection specialties as shown on Drawings and as specified.

1.02 SUBMITTALS

- A. Product Data: Submit Manufacturer's data and installation instructions for each item, including dimensions and anchorage details.

1.03 QUALITY ASSURANCE

- A. Standards: Comply with ANSI/UL 92 and 711.
- B. Regulatory Requirements: Conform to ANSI/NFPA 10 and the following:
1. ANSI A117.1 "Making Buildings and Facilities Accessible to and Usable by Physically Handicapped People."
  2. Public Law 101-336 "The Americans with Disabilities Act of 1990 (ADA).
  3. ADA Accessibility Guidelines (ADAAG).
  4. Uniform Federal Accessibility Standards (UFAS).
  5. The Arizonans with Disabilities Act of 1992 Administrative Rules (AzDAAG)

**PART 2 PRODUCTS**

2.01 MANUFACTURERS

- A. Furnish products of one of the following Manufacturers, except as approved by the Architect, subject to compliance with Specification requirements:
1. Larsen's Manufacturing Co.
  2. J.L. Industries
  3. General
  4. Knox
  5. Supra Products Co.

2.02 EQUIPMENT

- A. Multi-Purpose Dry Chemical Extinguisher:
1. Capacity and UL Rating: 2-1/2 lb., 1A-10B:C
  2. Tank: DOT approved steel cylinder.
  3. Metal valves and siphon tube.
  4. Replaceable molded valve stem seal.
  5. Pressure gauge.
4. Replaceable molded valve stem seal.
5. Pressure gauge.
- B. Wall Bracket: Manufacturer's standard J-type for wall hung extinguishers.
- C. Cabinet Signage: Horizontal lettering "FIRE EXTINGUISHER" above extinguishers mounted on wall surface, red color with white letters.

**PART 3 EXECUTION**

3.01 EXAMINATION

- A. Verification of Conditions: Examine subsurfaces to receive Work and report detrimental conditions in writing to Architect. Commencement of Work will be construed as acceptance of subsurfaces.
- B. Coordination: Coordinate with other Work which affects, connects with, or will be concealed by this Work.

3.02 INSTALLATION

- A. Install items in accordance with Manufacturer's directions. Install cabinets plumb and level at heights shown on Drawings.
- B. Comply with regulatory requirements and anchor securely.
- C. Verify that extinguishers are charged and tagged.
- D. Place extinguishers in cabinets and on wall brackets.

3.03 CLEANING

- A. During the course of the Work and on completion, remove and dispose of excess materials, equipment and debris away from premises. Leave Work in clean condition in accordance with Section 01500.

END OF SECTION

## SECTION 212200 - CLEAN-AGENT FIRE-EXTINGUISHING SYSTEMS – FM200

### PART 1 - GENERAL

#### 1.1 SUMMARY

A. Section Includes:

1. Piping and piping specialties.
2. Extinguishing-agent containers.
3. Extinguishing agent.
4. Detection and alarm devices.
5. Control and alarm panels.
6. Accessories.
7. Connection devices for and wiring between system components.
8. Connection devices for power and integration into building's fire-alarm system.

#### 1.2 MANUFACTURER

- A. The manufacturer/supplier of the system hardware and components shall have a minimum of fifteen (15) years experience in the design and manufacture of systems of similar type.
- B. The manufacturer/supplier of the systems shall be certified to ISO 9001 for a minimum period of five (5) years for the design, production and distribution of fire detection, fire alarm and fire suppression systems.
- C. All devices, components and equipment shall be the products of the same manufacturer/supplier.
- D. The system manufacturer/supplier shall have the ability to provide multiple suppression system arrangements to accommodate the performance criteria required by the project.
- E. Designer/Installer Suppression System Contractor:
1. The suppression system contractor shall be authorized to purchase and trained by the system manufacturer to design, install, test and maintain the clean agent fire extinguishing system, using FM-200 fire extinguishing agent proposed and shall be able to produce a certificate of training and/or a letter stating they are an authorized supplier of the proposed equipment from the manufacturer, upon request.
  2. The Contractor shall confirm in writing that he stocks a full complement of spare parts and offers 24-hour/7 days a week emergency service for all equipment being furnished.
  3. Maintain or have access to a recharging station capable of recharging the largest suppression system with 24 hours after discharge

#### 1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.

- B. LEED Submittals:
  - 1. Product Data for Credit EA 4: Documentation indicating that clean agents comply.
- C. Shop Drawings: For clean-agent fire-extinguishing system signed and sealed by a qualified professional engineer.
  - 1. Include plans, elevations, sections, details, and attachments to other work.
  - 2. Include design calculations.
  - 3. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
  - 4. Wiring Diagrams: For power, signal, and control wiring.
- D. Flow Calculation Reports
  - 1. The supplier/distributor shall provide the following information in the flow calculation report.
    - a. Customer information and project data.
    - b. The suppression system contractor shall employ a person who can show proficiency equal to a NICET level III or greater certification in special hazards design.
    - c. Hazard information. At a minimum, hazard information shall include the minimum design concentration and adjusted design concentration, minimum and maximum enclosure ambient temperature, minimum agent required, volume of enclosures and any corresponding non-permeable volume, and identify the quantity of discharge nozzles.
    - d. Cylinder information. At a minimum, cylinder information shall include total agent required, cylinder capacity, cylinder part number, cylinder quantities (both main and reserve), agent fill amount per cylinder and floor loading per cylinder.
    - e. Pipe network information. At a minimum, pipe network information shall include pipe type, pipe diameter, pipe length, change in elevation, pipe equivalent length and any added accessory equivalent length. In addition, the following nozzle information shall be provided; number of nozzles and identification of enclosure location, flow rate of associated nozzle, nozzle nominal pipe size, nozzle type and nozzle orifice area.
    - f. Pipes and pipe fittings. A detailed list of pipe, by schedule, nominal diameter and length, and fittings, by nominal diameter and quantity.

#### 1.4 INFORMATIONAL SUBMITTALS

- A. Permit Approved Drawings: Working plans, prepared according to NFPA 2001 “Standard for Clean Agent Fire Extinguishing Systems”, that have been approved by authorities having jurisdiction. Include design calculations.
- B. Field quality-control reports.
- C. Seismic Qualification Certificates: For extinguishing-agent containers and control panels from manufacturer.
  - 1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.

2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.

#### 1.5 CLOSEOUT SUBMITTALS

- A. Operation and maintenance data.

#### 1.6 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. FM Global Compliance: Provide components that are FM Approved and that are listed in FM Global's "Approval Guide."
- C. UL Compliance: Provide equipment listed in UL's "Fire Protection Equipment Directory."

### PART 2 - PRODUCTS

#### 2.1 CLEAN-AGENT SYSTEMS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide product by one of the following FM200 manufacturers:
  1. Ansul, a TYCO International Company.
  2. PYRO-CHEM, a TYCO International Company.
  3. Chemours.
  4. Chemetron Fire Systems; a UTC Fire & Security company.
  5. Fike Corporation.
  6. Or, Approved Equal.
- B. Description: Clean-agent fire-extinguishing system shall be an engineered system for total flooding of the hazard area including the room cavity above the ceiling, below the ceiling, and below the raised floor. System includes separate zones above and below the ceiling and beneath the raised floor. If smoke is detected below the raised floor, extinguishing agent shall be discharged in the underfloor zone only. If smoke is detected below the ceiling, extinguishing agent shall be discharged in zones above and below the ceiling and below the floor. If smoke is detected above the ceiling, extinguishing agent shall be discharged in the zone above the ceiling only.
- C. Delegated Design: Design clean-agent fire-extinguishing system and obtain approval from authorities having jurisdiction. Design system for Class A, B, and C fires as appropriate for areas being protected, and include safety factor. Use clean agent indicated and in concentration suitable for normally occupied areas.
- D. Performance Requirements:

1. Performance requirements for HFC 227ea per NFPA 2001.
- E. Cross-Zoned Detection: Devices located in two separate zones. Sound alarm on activating single-detection device, and discharge extinguishing agent on actuating single-detection device in other zone.
- F. System Operating Sequence:
1. Actuating First Detector: Visual indication on annunciator panel. Energize audible and visual alarms (slow pulse), shut down air-conditioning and ventilating systems serving protected area, close doors in protected area, and send signal to fire-alarm system.
  2. Actuating Second Detector: Visual indication on annunciator panel. Energize audible and visual alarms (fast pulse), shut down power to protected equipment, start time delay for extinguishing-agent discharge for 30 seconds, and discharge extinguishing agent. On agent discharge, release preaction valve to allow water to fill dry pipe sprinkler system.
  3. Extinguishing-agent discharge will operate audible alarms and strobe lights inside and outside the protected area.
- G. Manual stations shall immediately discharge extinguishing agent when activated.
- H. Operating abort switches will delay extinguishing-agent discharge while being activated, and switches must be reset to prevent agent discharge. Release of hand pressure on the switch will cause agent discharge if the time delay has expired.
- I. EPO: Will terminate power to protected equipment immediately on actuation.
- J. Low-Agent Pressure Switch: Initiate trouble alarm if sensing less than set pressure.
- K. Power Transfer Switch: Transfer from normal to stand-by power source.
- L. Seismic Performance: Fire-suppression piping and containers shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.
1. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified and the unit will be fully operational after the seismic event."

## 2.2 PIPING MATERIALS

- A. See "Manufacturer's Installation Manual". Article for applications of pipe, tube, fitting, and joining materials.
- B. Piping, Valves, and Discharge Nozzles: Comply with types and standards listed in NFPA 2001, Section "Distribution," for charging pressure of system.

## 2.3 PIPE AND FITTINGS

- A. Steel Pipe: ASTM A 53/A 53M, Type S, Grade B or ASTM A 106/A 106M, Grade A ; Schedule 40, Schedule 80, and Schedule 160, seamless steel pipe.

1. Threaded Fittings:
  - a. Malleable-Iron Fittings: ASME B16.3, Class 300.
  - b. Flanges and Flanged Fittings: ASME B16.5, Class 300 unless Class 600 is indicated.
  - c. Fittings Working Pressure: 620 psig minimum.
  - d. Flanged Joints: Class 300 minimum.
2. Forged-Steel Welding Fittings: ASME B16.11, Class 3000, socket pattern.
3. Steel, Grooved-End Fittings: FM Approved and NRTL listed, ASTM A 47/A 47M malleable iron or ASTM A 536 ductile iron, with dimensions matching steel pipe and ends factory grooved according to AWWA C606.

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.

C. Flange Bolts and Nuts: ASME B18.2.1, carbon steel.

D. Welding Filler Metals: Comply with AWS D10.12M/D10.12 for welding materials appropriate for wall thickness and chemical analysis of steel pipe being welded.

E. Steel, Keyed Couplings: UL 213, AWWA C606, approved or listed for clean-agent service, and matching steel-pipe dimensions. Include ASTM A 536, ductile-iron housing, rubber gasket, and steel bolts and nuts.

## 2.4 VALVES

A. General Valve Requirements:

1. UL listed or FM Approved for use in fire-protection systems.
2. Compatible with type of clean agent used.

B. Container Valves: With rupture disc or solenoid and manual-release lever, capable of immediate and total agent discharge and suitable for intended flow capacity.

C. Valves in Sections of Closed Piping and Manifolds: Fabricate to prevent entrapment of liquid, or install valve and separate pressure relief device.

D. Valves in Manifolds: Check valve; installed to prevent loss of extinguishing agent when container is removed from manifold.

## 2.5 EXTINGUISHING-AGENT CONTAINERS

A. Description: Steel tanks complying with ASME Boiler and Pressure Vessel Code: Section VIII, for unfired pressure vessels. Include minimum working-pressure rating that matches system charging pressure, valve, pressure switch, and pressure gage.

1. Finish: Red, enamel or epoxy paint.
2. Agent Tank: The agent storage tank shall consist of an approved DOT 4BW450 or DOT4BW4500 high pressure steel tank fitted with a valve and internal siphon tube, factory filled with FM-200, and super-pressurized with dry nitrogen to 360 psi at 70 deg. F. Tanks sharing the same manifold shall be equal in size and fill density. A nameplate shall adhere to each tank displaying the agent weight, tare weight, gross weight, fill density, and charge date. Each tank shall be fitted with a liquid level indicator.
3. Manifold: Fabricate with valves, pressure switches, and connections for multiple storage containers, as indicated.
4. Storage-Tank Brackets: Factory-fabricated retaining brackets consisting of steel straps and channels; suitable for container support, maintenance, and tank refilling or replacement.

## 2.6 FIRE-EXTINGUISHING CLEAN AGENT

### A. HFC 227ea Clean Agent: Heptafluoropropane.

1. Basis-of-Design Product: Subject to compliance with requirements, provide product by one of the following:
  - a. PYRO\_CHEM, a Tyco International Company.
  - b. Chemours.
  - c. Chemetron Fire Systems; a UTC Fire & Security company.
  - d. Fike Corporation.
  - e. DuPont.
  - f. Or, Approved Equal.

## 2.7 DISCHARGE NOZZLES

- ### A. Equipment manufacturer's standard one-piece brass or aluminum alloy of type, size, discharge pattern, and capacity required for application.

## 2.8 CONTROL PANELS

- ### A. Description: FM Approved or NRTL listed, including equipment and features required for testing, supervising, and operating fire-extinguishing system.
- ### B. Power Requirements: 120/240-V ac; with electrical contacts for connection to system components and fire-alarm system, and transformer or rectifier as needed to produce power at voltage required for accessories and alarm devices.
- ### C. Enclosure: NEMA ICS 6, Type 1, enameled-steel cabinet.
1. Mounting: Recessed flush with surface.
- ### D. Supervised Circuits: Separate circuits for each independent hazard area.
1. Detection circuits equal to the required number of zones, or addressable devices assigned to the required number of zones.

2. Manual pull-station circuit.
3. Alarm circuit.
4. Release circuit.
5. Abort circuit.
6. EPO circuit.

E. Control-Panel Features:

1. Electrical contacts for shutting down fans, activating dampers, and operating system electrical devices.
2. Automatic switchover to standby power at loss of primary power.
3. Storage container, low-pressure indicator.
4. Service disconnect to interrupt system operation for maintenance with visual status indication on the annunciator panel.

F. Annunciator Panel: Graphic type showing protected, hazard-area plans, as well as locations of detectors and abort, EPO, and manual stations. Include lamps to indicate device-initiating alarm, electrical contacts for connection to control panel, and stainless-steel or aluminum enclosure.

G. Standby Power: Sealed lead calcium batteries with capacity to operate system for 24 hours and alarm for minimum of 15 minutes. Include automatic battery charger that has a varying charging rate between trickle and high depending on battery voltage, and that is capable of maintaining batteries fully charged. Include manual voltage control, dc voltmeter, dc ammeter, electrical contacts for connection to control panel, automatic transfer switch, and suitable enclosure.

## 2.9 DETECTION DEVICES

A. General Requirements for Detection Devices:

1. Comply with NFPA 2001, NFPA 72, and UL 268.
2. 24-V dc, nominal.

B. Ionization Detectors: Dual-chamber type, having sampling and referencing chambers, with smoke-sensing element.

C. Photoelectric Detectors: LED light source and silicon photodiode receiving element.

D. Signals to the existing Central Fire Alarm Control Panel manufactured by HONEYWELL: Any type of local system trouble is reported to the central fire alarm control panel as a composite "trouble" signal. Alarms on each system zone are individually reported to the central fire alarm control panel as separately identified zones.

## 2.10 MANUAL STATIONS

A. General Description: Surface FM Approved or NRTL listed, with clear plastic hinged cover, 120-V ac or low voltage compatible with controls. Include contacts for connection to control panel.

- B. Manual Release: "MANUAL RELEASE" caption, and red finish. Unit can manually discharge extinguishing agent with operating device that remains engaged until unlocked.
- C. Abort Switch: "ABORT" caption, momentary contact, with green finish.
- D. EPO Switch: "EPO" caption, with yellow finish.

## 2.11 SWITCHES

- A. Description: FM Approved or NRTL listed, where available, 120-V ac or low voltage compatible with controls. Include contacts for connection to control panel.
  - 1. Low-Agent Pressure Switches: Pneumatic operation.
  - 2. Power Transfer Switches: Key-operation selector, for transfer of release circuit signal from main supply to reserve supply.
  - 3. Door Closers: Magnetic retaining and release device or electrical interlock to cause the door operator to drive the door closed.

## 2.12 ALARM DEVICES

- A. Description: Listed and labeled by an NRTL or FM Approved, low voltage, and surface mounting.
- B. Bells: Minimum 6-inch diameter.
- C. Horns: 90 to 94 dBA.
- D. Strobe Lights: Translucent lens, with "FIRE" or similar caption.

## PART 3 - EXECUTION

### 3.1 HFC 227ea agent PIPING APPLICATIONS

- A. Flanged pipe and fittings and flanged joints may be used to connect to specialties and accessories and where required for maintenance.
- B. NPS 2 and Smaller: Schedule 40, steel pipe; malleable-iron threaded fittings; and threaded joints.
- C. NPS 2-1/2 and Larger: Schedule 40, steel pipe; forged-steel welding fittings; and welded joints.

### 3.2 CLEAN-AGENT PIPING INSTALLATION

- A. Install clean-agent extinguishing piping and other components level and plumb, according to manufacturers' written instructions.
- B. Install extinguishing-agent containers anchored to substrate.

- C. Install pipe and fittings, valves, and discharge nozzles according to requirements listed in NFPA 2001, Section "Distribution."
  - 1. Install valves designed to prevent entrapment of liquid, or install pressure relief devices in valved sections of piping systems.
  - 2. Support piping using supports and methods according to NFPA 13.
  - 3. Install seismic restraints for extinguishing-agent containers and piping systems.
  - 4. Install control panels, detection system components, alarms, and accessories, complying with requirements of NFPA 2001, Section "Detection, Actuation, and Control Systems," as required for supervised system application.
- D. Drawings indicate general arrangement of piping, fittings, and specialties.
- E. Where installing piping adjacent to equipment, allow space for service and maintenance.
- F. Connect electrical devices to control panel and to building's fire-alarm system
- G. Identify piping, extinguishing-agent containers, other equipment, and panels according to NFPA 2001.
- H. Install signs at entry doors for protected areas to warn occupants that they are entering a room protected with a clean-agent fire-extinguishing system.
- I. Install signs at entry doors to advise persons outside the room the meaning of the horn(s), bell(s), and strobe light(s) outside the protected space.

### 3.3 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
  - 1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.
- B. Tests and Inspections:
  - 1. After installing clean-agent extinguishing piping system and after electrical circuitry has been energized, test for compliance with requirements.
  - 2. Perform each electrical test and visual and mechanical inspection stated in NETA ATS, Sections "Inspection and Test Procedures" and "System Function Tests." Certify compliance with test parameters.
  - 3. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
  - 4. 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.
  - 5. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- C. Units will be considered defective if they do not pass tests and inspections.

- D. Prepare test and inspection reports.

### 3.4 SYSTEM FILLING

- A. Preparation:

1. Verify that piping system installation is completed and cleaned.
2. Check for complete enclosure integrity.
3. Check operation of ventilation and exhaust systems.

- B. Filling Procedures:

1. Fill extinguishing-agent containers with extinguishing agent, and pressurize to indicated charging pressure.
2. Install filled extinguishing-agent containers.
3. Energize circuits.
4. Adjust operating controls.

### 3.5 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain clean-agent fire-extinguishing systems.

END OF SECTION 212200

SECTION 26 05 11  
REQUIREMENTS FOR ELECTRICAL INSTALLATIONS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This section applies to all sections of Division 26.
- B. Furnish and install electrical wiring, systems, equipment and accessories in accordance with the specifications and drawings. Capacities and ratings of motors, transformers, cable, switchboards, switchgear, panelboards, motor control centers, generators, automatic transfer switches, and other items and arrangements for the specified items are shown on drawings.
- C. Wiring ampacities specified or shown on the drawings are based on copper conductors, with the conduit and raceways accordingly sized. Aluminum conductors are prohibited.

1.2 MINIMUM REQUIREMENTS

- A. References to the latest adopted International Building Code (IBC), National Electrical Code (NEC), Underwriters Laboratories, Inc. (UL) and National Fire Protection Association (NFPA) by the Authority Having Jurisdiction (AHJ) are minimum installation requirement standards.
- B. Drawings and other specification sections shall govern in those instances where requirements are greater than those specified in the above standards.

1.3 TEST STANDARDS

- A. All materials and equipment shall be listed, labeled or certified by a nationally recognized testing laboratory to meet Underwriters Laboratories, Inc., standards where test standards have been established. Equipment and materials which are not covered by UL Standards will be accepted provided equipment and material is listed, labeled, certified or otherwise determined to meet safety requirements of a nationally recognized testing laboratory. Equipment of a class which no nationally recognized testing laboratory accepts, certifies, lists, labels, or determines to be safe, will be considered if inspected or tested in accordance with national industrial standards, such as NEMA, or ANSI. Evidence of compliance shall include certified test reports and definitive shop drawings.
- B. Definitions:
  - 1. Listed; Equipment, materials, or services included in a list published by an organization that is acceptable to the AHJ and concerned with evaluation of products or services, that maintains periodic inspection of production or listed equipment or materials or periodic evaluation of services, and whose listing states that the equipment, material, or services either meets appropriate designated standards or has been tested and found suitable for a specified purpose.
  - 2. Labeled; Equipment or materials to which has been attached a label, symbol, or other identifying mark of an organization that is acceptable to the AHJ and concerned with product evaluation, that maintains periodic inspection of production of labeled equipment or materials,

REQUIREMENTS FOR ELECTRICAL INSTALLATIONS

and by whose labeling the manufacturer indicates compliance with appropriate standards or performance in a specified manner.

3. Certified; equipment or product which:
  - a. Has been tested and found by a nationally recognized testing laboratory to meet nationally recognized standards or to be safe for use in a specified manner.
  - b. Production of equipment or product is periodically inspected by a nationally recognized testing laboratory.
  - c. Bears a label, tag, or other record of certification.
4. Nationally recognized testing laboratory; laboratory which is approved, in accordance with OSHA regulations, by the Secretary of Labor.

#### 1.4 QUALIFICATIONS (PRODUCTS AND SERVICES)

- A. Manufacturers Qualifications: The manufacturer shall regularly and presently produce, as one of the manufacturer's principal products, the equipment and material specified for this project, and shall have manufactured the item for at least three years.
- B. Product Qualification:
  1. Manufacturer's product shall have been in satisfactory operation, on three installations of similar size and type as this project, for approximately three years.
  2. The **Lake Havasu City** here after referred to as "OWNER" reserves the right to require the Contractor to submit a list of installations where the products have been in operation before approval.
- C. Service Qualifications: There shall be a permanent service organization maintained or trained by the manufacturer which will render satisfactory service to this installation within four hours of receipt of notification that service is needed. Submit name and address of service organizations.

#### 1.5 APPLICABLE PUBLICATIONS

Applicable publications listed in all Sections of Division are the latest issue, unless otherwise noted.

#### 1.6 MANUFACTURED PRODUCTS

- A. Materials and equipment furnished shall be of current production by manufacturers regularly engaged in the manufacture of such items, for which replacement parts shall be available.
- B. When more than one unit of the same class or type of equipment is required, such units shall be the product of a single manufacturer.
- C. Equipment Assemblies and Components:
  1. Components of an assembled unit need not be products of the same manufacturer.
  2. Manufacturers of equipment assemblies, which include components made by others, shall assume complete responsibility for the final assembled unit.
  3. Components shall be compatible with each other and with the total assembly for the intended service.
  4. Constituent parts which are similar shall be the product of a single manufacturer.

#### REQUIREMENTS FOR ELECTRICAL INSTALLATIONS

D. Factory wiring shall be identified on the equipment being furnished and on all wiring diagrams.

E. When Factory Testing Is Specified:

1. The Owner shall have the option of witnessing factory tests. The contractor shall notify the Owner through the Resident Electrical Engineer a minimum of 15 working days prior to the manufacturers making the factory tests.
2. Four copies of certified test reports containing all test data shall be furnished to the Resident Electrical Engineer prior to final inspection and not more than 90 days after completion of the tests.
3. When equipment fails to meet factory test and re-inspection is required, the contractor shall be liable for all additional expenses, including expenses of the Owner.

#### 1.7 EQUIPMENT REQUIREMENTS

Where variations from the contract requirements are requested in accordance with Section 01 60 00, PRODUCTS AND SUBSTITUTIONS and Section 01 33 00, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES, the connecting work and related components shall include, but not be limited to additions or changes to branch circuits, circuit protective devices, conduits, wire, feeders, controls, panels and installation methods.

#### 1.8 EQUIPMENT PROTECTION

- A. Equipment and materials shall be protected during shipment and storage against physical damage, vermin, dirt, corrosive substances, fumes, moisture, cold and rain.
1. Store equipment indoors in clean dry space with uniform temperature to prevent condensation. Equipment shall include but not be limited to switchgear, switchboards, panelboards, transformers, motor control centers, motor controllers, uninterruptible power systems, enclosures, controllers, circuit protective devices, cables, wire, light fixtures, electronic equipment, and accessories.
  2. During installation, equipment shall be protected against entry of foreign matter; and be vacuum-cleaned both inside and outside before testing and operating. Compressed air shall not be used to clean equipment. Remove loose packing and flammable materials from inside equipment.
  3. Damaged equipment shall be, as determined by the Resident Engineer, placed in first class operating condition or be returned to the source of supply for repair or replacement.
  4. Painted surfaces shall be protected with factory installed removable heavy kraft paper, sheet vinyl or equal.
  5. Damaged paint on equipment and materials shall be refinished with the same quality of paint and workmanship as used by the manufacturer so repaired areas are not obvious.

#### 1.9 WORK PERFORMANCE

- A. All electrical work must comply with the requirements of NFPA 70 (NEC), NFPA 70B, NFPA 70E, OSHA Part 1910 subpart J, OSHA Part 1910 subpart S and OSHA Part 1910 subpart K in addition to other references required by contract.

#### REQUIREMENTS FOR ELECTRICAL INSTALLATIONS

- B. Job site safety and worker safety is the responsibility of the contractor.
- C. Electrical work shall be accomplished with all affected circuits or equipment de-energized. When an electrical outage cannot be accomplished in this manner for the required work, the following requirements are mandatory:
  - 1. Electricians must use full protective equipment (i.e., certified and tested insulating material to cover exposed energized electrical components, certified and tested insulated tools, etc.) while working on energized systems in accordance with NFPA 70E.
  - 2. Electricians must wear personal protective equipment while working on energized systems in accordance with NFPA 70E.
  - 3. Before initiating any work, a job specific work plan must be developed by the contractor with a peer review conducted and documented by the Resident Engineer and Medical Center staff. The work plan must include procedures to be used on and near the live electrical equipment, barriers to be installed, safety equipment to be used and exit pathways.
  - 4. Work on energized circuits or equipment cannot begin until prior written approval is obtained from the Resident Electrical Engineer.
- D. For work on existing stations, coordinate, arrange, phase and perform work to assure electrical service for other buildings at all times.
- E. New work shall be installed and connected to existing work neatly, safely and professionally. Disturbed or damaged work shall be replaced or repaired to its prior conditions,
- F. Coordinate location of equipment and conduit with other trades to minimize interferences.

#### 1.10 EQUIPMENT INSTALLATION AND REQUIREMENTS

- A. Equipment location shall be as close as practical to locations shown on the drawings.
- B. Working spaces shall not be less than specified in the NEC for all voltages specified.
- C. Inaccessible Equipment:
  - 1. Where the Owner determines that the Contractor has installed equipment not conveniently accessible for operation and maintenance, the equipment shall be removed and reinstalled as directed at no additional cost to the Owner.
  - 2. "Conveniently accessible" is defined as being capable of being reached quickly for operation, maintenance, or inspections without the use of ladders, or without climbing or crawling under or over obstacles such as, but not limited to, motors, pumps, belt guards, transformers, piping, ductwork, conduit and raceways.

#### 1.11 EQUIPMENT IDENTIFICATION

- A. In addition to the requirements of the NEC, install an identification sign which clearly indicates information required for use and maintenance of items such as switchboards and switchgear, panelboards, cabinets, motor controllers (starters), fused and non-fused safety switches, automatic transfer switches, separately enclosed circuit breakers, individual breakers and controllers in switchboards, switchgear and motor control assemblies, control devices and other significant equipment.

#### REQUIREMENTS FOR ELECTRICAL INSTALLATIONS

- B. Nameplates for Normal Power System equipment shall be laminated black phenolic resin with a white core with engraved lettering. Nameplates for Essential Electrical System (EES) equipment, as defined in the NEC, shall be laminated red phenolic resin with a white core with engraved lettering. Lettering shall be a minimum of 1/2 inch [12mm] high. Nameplates shall indicate equipment designation, rated bus amperage, voltage, number of phases, number of wires, and type of EES power branch as applicable. Secure nameplates with screws. See Specification 26-0553 for additional requirements.
- C. Install adhesive arc flash warning labels on all equipment as required by NFPA 70E. Label shall indicate the arc hazard boundary (inches), working distance (inches), arc flash incident energy at the working distance (calories/cm<sup>2</sup>), required PPE category and description including the glove rating, voltage rating of the equipment, limited approach distance (inches), restricted approach distance (inches), prohibited approach distance (inches), equipment/bus name, date prepared, and manufacturer name and address.

#### 1.12 SUBMITTALS

- A. Submit SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. The Owner's approval shall be obtained for all equipment and material before delivery to the job site. Delivery, storage or installation of equipment or material which has not had prior approval will not be permitted at the job site.
- C. All submittals shall include adequate descriptive literature, catalog cuts, shop drawings and other data necessary for the Owner to ascertain that the proposed equipment and materials comply with specification requirements. Catalog cuts submitted for approval shall be legible and clearly identify equipment being submitted.
- D. Submittals for individual systems and equipment assemblies which consist of more than one item or component shall be made for the system or assembly as a whole. Partial submittals will not be considered for approval.
  - 1. Mark the submittals, "SUBMITTED UNDER SECTION           (as applicable)          ".
  - 2. Submittals shall be marked to show specification reference including the section and paragraph numbers.
  - 3. Submit each section separately.
- E. The submittals shall include the following:
  - 1. Information that confirms compliance with contract requirements. Include the manufacturer's name, model or catalog numbers, catalog information, technical data sheets, shop drawings, pictures, nameplate data and test reports as required.
  - 2. Elementary and interconnection wiring diagrams for communication and signal systems, control systems and equipment assemblies. All terminal points and wiring shall be identified on wiring diagrams.
  - 3. Parts list which shall include those replacement parts recommended by the equipment manufacturer.

#### REQUIREMENTS FOR ELECTRICAL INSTALLATIONS

F. Manuals: Submit in accordance with Section 01 00 00, GENERAL REQUIREMENTS as well as in Section 01 70 00, PROJECT CLOSEOUTS.

1. Maintenance and Operation Manuals: Submit as required for systems and equipment specified in the technical sections. Furnish four copies, bound in hardback binders, (manufacturer's standard binders) or an approved equivalent. Furnish one complete manual as specified in the technical section but in no case later than prior to performance of systems or equipment test, and furnish the remaining manuals prior to contract completion.
2. Inscribe the following identification on the cover: the words "MAINTENANCE AND OPERATION MANUAL," the name and location of the system, equipment, building, name of Contractor, and contract number. Include in the manual the names, addresses, and telephone numbers of each subcontractor installing the system or equipment and the local representatives for the system or equipment.
3. Provide a "Table of Contents" and assemble the manual to conform to the table of contents, with tab sheets placed before instructions covering the subject. The instructions shall be legible and easily read, with large sheets of drawings folded in.
4. The manuals shall include:
  - a. Internal and interconnecting wiring and control diagrams with data to explain detailed operation and control of the equipment.
  - b. A control sequence describing start-up, operation, and shutdown.
  - c. Description of the function of each principal item of equipment.
  - d. Installation instructions.
  - e. Safety precautions for operation and maintenance.
  - f. Diagrams and illustrations.
  - g. Periodic maintenance and testing procedures and frequencies, including replacement parts numbers and replacement frequencies.
  - h. Performance data.
  - i. Pictorial "exploded" parts list with part numbers. Emphasis shall be placed on the use of special tools and instruments. The list shall indicate sources of supply, recommended spare parts, and name of servicing organization.
  - j. List of factory approved or qualified permanent servicing organizations for equipment repair and periodic testing and maintenance, including addresses and factory certification qualifications.

G. Approvals will be based on complete submission of manuals together with shop drawings.

#### 1.13 SINGULAR NUMBER

Where any device or part of equipment is referred to in these specifications in the singular number (e.g., "the switch"), this reference shall be deemed to apply to as many such devices as are required to complete the installation as shown on the drawings.

#### REQUIREMENTS FOR ELECTRICAL INSTALLATIONS

#### 1.15 ACCEPTANCE CHECKS AND TESTS

The contractor shall furnish the instruments, materials and labor for field tests.

#### 1.16 TRAINING

- A. Training shall be provided for the particular equipment or system as required in each associated specification.
- B. A training schedule shall be developed and submitted by the contractor and approved by the Resident Engineer at least 30 days prior to the planned training.

END OF SECTION 26 05 11

## SECTION 26 05 19

### LOW VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

#### 1.0 GENERAL

#### 1.1 SECTION INCLUDES

- A. Wire (600 VAC)
- B. Metal-clad cable (600 VAC) or alternate
- C. Wire and cable connectors
- D. Insulating tape and tubing
- E. Wire pulling lubricant

#### 1.2 QUALITY ASSURANCE

- A. Comply with the National Electrical Code (NEC) for components and installation.
- B. Provide products that are listed and labeled for the application and environment in which installed.

#### 1.3 SUBMITTALS

- A. Submit the following in accordance with the provisions of Submittal Procedures:
  - 1. Catalog Data: Compression connectors; indicate installation tools and dies that will be used, conduit, wire/cable, etc.
  - 2. Provide seven (7) copies of data to project engineer for approval

#### 1.4 PROJECT RECORD DOCUMENTS

- A. Submit the following:
  - 1. Field Test Records:
    - a. Cable pulling records.
    - b. Inspections and tests required in Field Quality Control.

#### 1.5 RECEIVING, STORING AND PROTECTING

- A. Receive, store, and protect, and handle products according to NECA 1, Standard Practices for Good Workmanship in Electrical Construction.

LOW VOLTAGE ELECTRICAL POWER CONDUCTORS & CABLES

## PART 2 PRODUCTS

### 2.1 PRODUCT OPTIONS AND SUBSTITUTIONS

- A. All substitutions to be approved by Resident Electrical Engineer in writing..

### 2.2 BUILDING WIRE

- A. Provide wire as shown on the Drawings with the following characteristics:

1. Description: Single conductor 600 VAC insulated wire. All wire to be copper not aluminum. "ALUMINUM NOT ALLOWED"
2. Conductor:
  - a. Unless otherwise indicated on the Drawings: 98% conductivity, annealed, uncoated copper, ASTM B 3 Standard Specification for Soft or Annealed Copper Wire, solid or stranded as specified in Part 3 of this Section.
3. Insulation: The following types, rated 600 VAC:
  - a. Unless otherwise indicated on the Drawings: #1 AWG and smaller, Type THHN/THWN-2 per UL Standard 83, "Thermoplastic-Insulated Wires and Cables."
  - b. Where indicated on the drawings: #1/0 AWG and smaller, Type XHHW-2 per UL Standard 44, "Thermoset-Insulated Wires and Cables."
  - c. #1/0 AWG and larger, Type XHHW per UL Standard 44, "Thermoset-Insulated Wires and Cables."

- B. Color code conductors as follows:

1. Use colored insulation for color coding conductors #6 AWG and smaller.
2. Use water and oil resistant colored plastic adhesive tape, 3/4 inch minimum width, for color coding conductor #4 AWG and larger. Manufacturer: 3M "Scotch 35"
3. Provide black conductor insulation where colored tape is used for color coding.
4. Use existing facility wire color coding, if none is available, use below table in item B5.
5. Use the following color codes for AC power system conductors:

System Voltage:	480Y/277V	208Y/120V	208Y/120V Isolated Ground	120/240V
Conductor:				
Phase A:	Brown	Black	Black	Black
Phase B:	Orange	Red	Red	Red
Phase C:	Yellow	Blue	Blue	---
Grounded (Neutral):	Gray	White	White White/Red*	White White/Blue*
Equipment Grounding:	Green	Green	Green	Green
Isolated Ground:	---	---	Green/Yellow	---
Switched:	Purple	Pink	---	Blue

\* Provide grounded conductor insulation with colored stripe when installed in any raceway, box, or enclosure with wiring of another system voltage.

6. Provide color code for control conductors as indicated on equipment or control system manufacturer's drawings.

## 2.3 WIRING CONNECTORS

- A. For splices and taps on copper wire, sizes #20 to #12 AWG solid and #16 to #14 AWG stranded, use push-on, insulated, spring type connectors, rated 600 VAC and 105 °C that are listed to UL 486C Splicing Wire Connectors and provide a means of visual inspection of the connection. Manufacturer: IDEAL "In-Sure" or equivalent.
- B. For splices and taps on copper wire, sizes #8 AWG and smaller, use insulated, spring type connectors, rated 600 VAC and 105 °C that are listed to UL 486C, Splicing Wire Connectors. Manufacturer: 3M "Scotchlok" or equivalent.
- C. For splices and taps on copper wire, sizes #6 AWG through #1 AWG, use the following materials:
  1. Tin-plated copper split-bolt connectors that meet the requirements in UL 486A-486B, Wire Connectors; provide with matching 600 VAC snap-on insulating cover. Manufacturer: FCI Burndy "Type KSA" with "Type SC" insulating cover or equivalent.
  2. Multi-tap connectors that meet the requirements of UL 486A-466B that have two or more range-taking mechanical lugs and matching 600 VAC insulated cover. Manufacturers: Burndy "POLYTAP" or "UNITAP", IlSCO "Type PCT", Blackburn "AMT" or equivalent.
- D. For copper wire, sizes #1/0 AWG and larger, use UL 486A-486B listed circumferential or hexagonal crimp compression terminals, splices, or adapters.
  1. Provide compression terminals and splices made from electro-tin plated seamless copper tubing and marked with wire size, die index / color code, and number / locations of crimps. Manufacturers: FCI Burndy Types "YA",

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“YA-L”, “YA-L-NT”, “YS”, and “YC-C.” Thomas & Betts “Color-Keyed” or equivalent.

2. Provide straight and offset compression adapters made from electro-tin plated aluminum, NRTL listed for use on copper conductors, and marked with wire size, die index / color code, and number / locations of crimps. Each adapter shall include a 600 VAC, 90 degree C rated insulating cover. Manufacturer: FCI Burndy Types “AYP” and “AYPO” or equivalent.
  3. Range-taking, die-less, or indenter-applied terminals are not acceptable.
- E. For control wiring use nylon insulated crimp-on terminals with insulation grip that meet the requirements of UL 486A-486B. Manufacturer: 3M “Scotchlok MNG,” Thomas & Betts “Sta-Kon” or equivalent.
1. Use ring tongue terminals for nutted studs.
  2. Use flanged fork terminals for barrier terminal blocks.
  3. Use pin terminals or ferrules for DIN type terminal blocks.
- F. Insulation-piercing type connectors are not acceptable for power or control wiring.

#### 2.4 INSULATING TAPE AND TUBING

- A. For making re-enterable tape-insulated splices and connections, provide varnished cambric electrical insulating tape made of cotton cambric fabric that is oil primed and coated with electrical insulating varnish. Manufacturer: 3M “Scotch 2510” (no adhesive) and Scotch 2520” (pressure-sensitive adhesive) or equivalent.
- B. Insulate taped splices and connections using ethylene propylene rubber (EPR) tape that meets the requirements of UL 510 - Polyvinyl Chloride, Polyethylene, and Rubber Insulating Tape and is rated for 90 °C continuous operation and 130 °C short-term overload service. Manufacturer: 3M “Scotch 130C” or equivalent.
- C. For the outer covering of tape-insulated splices and connections use vinyl plastic tape that meets the requirements of UL 510 - Polyvinyl Chloride, Polyethylene, and Rubber Insulating Tape and has the following characteristics:
1. 8.5 mil minimum thickness,
  2. ASTM D-3005, “Standard Specification for Low-Temperature Resistant Vinyl Chloride Plastic Pressure-Sensitive Electrical Insulating Tape – Type 1.”
  3. Rated 600 VAC and 105 °C, suitable for indoor and outdoor applications.
  4. Retains flexibility, adhesion, and applicable at temperature ranges from 0 through 100 °F without loss of physical or electrical properties.

5. Resistant to abrasion, moisture, alkalis, acid, corrosion, and sunlight.
  6. Manufacturer: 3M "Scotch Super 88" or equivalent.
- D. Provide heat shrinkable tubing that meets the requirements of UL 486D – Sealed Wire Connector Systems and has the following characteristics:
1. Rated 600 VAC
  2. Factory applied adhesive/sealant
  3. Split resistant
  4. Manufacturer: 3M "ITCSN", or equivalent.
- E. Use motor lead splicing kits to insulate and seal connections to leads for motors rated 480 VAC and less. Manufacturer: 3M "5300 Series"

## 2.5 WIRE PULLING LUBRICANT

- A. Provide wire pulling lubricant that is compatible with the conductor insulation or jacket, has a maximum coefficient of dynamic friction of 0.25, and leaves no flammable residue. For cold weather installations, provide wire pulling lubricant suitable for conduit temperature.
- B. Compatibility with conductor insulation shall be determined in accordance with IEEE Std 1210, Standard Tests for Determining Compatibility of Cable-Pulling Lubricants with Wire and Cable.
- C. Manufacturer:
1. For conduit temperature above freezing: Polywater "Lubricant J" or equivalent.
  2. For conduit temperature below freezing: Polywater "Lubricant WJ" or equivalent.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Verify that work of other trades likely to damage wire and cable is coordinated to prevent damage.
- B. Verify raceway installation is complete and supported.
- C. Verify that field measurements and conduit routing are as shown on Drawings. See item E.1 below.
- D. Wire and cable routing shown on Drawings is approximate unless dimensioned.

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1. Route wire and cable as required meeting project conditions.
2. Where cable routing is not shown, and destination only is indicated, determine exact routing and lengths required to meet Project conditions.

### 3.2 PREPARATION

- A. Examine raceways and building finishes that are to receive wires and cables for compliance with installation tolerances and other conditions. Do not proceed with installation until unsatisfactory conditions have been corrected.
- B. Completely and thoroughly swab raceway before installing wire.
- C. Do not handle or pull cables that are colder than +14° F. Store cold cables for at least 24 hours in a heated building prior to installation.

### 3.3 EXISTING WORK

- A. Remove abandoned conduit, wire and cable. Patch surfaces where removed cables pass through building finishes.
- B. Disconnect abandoned circuits and remove circuit conduit, wire and cable. Remove abandoned boxes when wire and cable servicing boxes are abandoned and removed.
- C. Provide access to existing wiring connections remaining active and requiring access. Modify installation or install access panel.
- D. Extend existing circuits using materials and methods of "like kind" or as specified.

### 3.4 CONDUIT & WIRE INSTALLATION

- A. Install conduit & wire according to, the NEC, the requirements in this Section, and the following NECA installation standards as applicable:
  1. NECA 1 Standard for Good Workmanship in Electrical Construction (ANSI).
- B. Do not damage conductor, insulation, or jacket by excessive installation pulling tension or sidewall bearing pressure.
  1. Calculate expected cable pulling tension and sidewall bearing pressures for each set of conductors being pulled into a conduit run where any of the following combinations of bends and raceway length is exceeded between accessible pull points: (max 3 – 90 degree bends between pull points)
    - a. 3 equivalent 90-degree bends and 40 feet of raceway.
    - b. 2 equivalent 90-degree bends and 80 feet of raceway.
    - c. 1 equivalent 90-degree bend and 150 feet of raceway.

- d. Straight pull with more than 250 feet of raceway.
- 2. For cable pulling tension and sidewall bearing pressure calculations use formulas and factors described in IEEE Std 422, IEEE Guide for the Design and Installation of Cable Systems in Power Generating Stations.
- 3. Obtain recommended maximum conductor or cable pulling tension and sidewall bearing pressure values from the manufacturer, or use the following maximum allowable values:
  - a. Maximum sidewall bearing pressure: 500 lb/ft.
  - b. Maximum tension, pulling directly on conductor: 0.008 lb/cmil
  - c. Maximum tension, pulling on basket grip over insulation jacket: 2000 lb, not to exceed 0.008 lb/cmil of conductor.
- 4. Use a tension measuring device to monitor pulling force on runs where cable pulling calculations indicate installation stresses may exceed 80 percent of allowable pulling tension or sidewall bearing pressure.
  - a. Record the maximum measured pulling tension for each monitored cable pull.
  - b. Submit the recorded cable pulling tension for each monitored cable pull and the corresponding calculated allowable pulling tension.
- C. Use solid copper conductors for power circuits 10 AWG and smaller except use stranded conductors in flexible conduits.
- D. Use stranded conductors for power circuits #8 AWG and larger.
- E. Use copper conductors not smaller than #12 AWG for power and lighting branch circuits.
- F. Use stranded copper conductors not smaller than #14 AWG for 120VAC control circuits.
- G. Use minimum #10 AWG copper conductors from panelboard to first outlet for 20-ampere, 120 VAC branch circuits longer than 75 feet; use larger conductors as indicated on the Drawings.
- H. Do not “through-pull” conductors at boxes, fittings or cabinets where a change of raceway alignment occurs.
- I. Install wiring at outlets with at minimum of 6 inches of conductor showing at each outlet.

### 3.5 CONNECTOR INSTALLATION

- A. Install conductors in terminals, splices, adapters, and connectors in accordance with the manufacturer's instructions. Have the manufacturer's installation instructions available at the construction site.
- B. Make splices, taps, and terminations to carry full ampacity of conductors with no perceptible temperature rise above the conductor temperature.
- C. Do not nick conductors when removing insulation.
- D. Do not cut conductor strands to fit into connectors, splices, adapters, or terminals.
- E. Make connections using clean connection surfaces. Wire brush conductors immediately before installing lugs, terminals, splices, or adapters.
- F. Connect conductors #1/0 AWG and larger using compression terminals at the locations described below where there is adequate wire bending space to accommodate compression terminals. Select compression terminals suitable for the conductor sizes, materials, and termination point configurations. Install compression terminals using the manufacturer's recommended dies and minimum 12-ton force compression tools.
  - 1. Circuit breakers with frame size greater than 100 amperes that are NRTL listed for use with compression terminals. Use compression adapters where the circuit breaker is not listed for compression terminals.
  - 2. Safety switches and fused switches rated more than 100 amperes.
  - 3. Switchgear, switchboards, panelboards, busway, motor control centers, and similar service and distribution equipment.
  - 4. Utilization equipment connections that are listed for use with compression terminals.
- G. Install copper conductors, #1/0 AWG and larger, connect using mechanical lugs, in the locations or conditions described below.
  - 1. Connection points not listed for either compression terminals or compression adapters.
  - 2. Where there is insufficient wire bending space to accommodate either compression terminals or compression adapters.
  - 3. 100 ampere frame circuit breakers.
  - 4. 30, 60, and 100 ampere safety switches.
- H. Terminate power conductors smaller than #1/0 AWG using mechanical lugs.

- I. Terminate control conductors using crimp-on terminals or ferrules. Do not place stranded conductors directly under terminal screws. Install terminals or ferrules on conductors using ratchet-type compression tools.
- J. Connect outlets and components to wiring and to ground as indicated and instructed by manufacturer. Tighten connectors and terminals, including screws and bolts, according to equipment manufacturer's published torque-tightening values for equipment connectors. Where manufacturer's torque requirements are not indicated, tighten connectors and terminals according to tightening torques specified in UL Standard 486A-486B.

### 3.6 INSULATING TAPE AND TUBING INSTALLATION

- A. Install insulating tape and tubing in accordance with the manufacturer's instructions. Have the manufacturer's installation instructions available at the construction site.
- B. Insulate splices and taps of irregular shapes with manufactured insulating covers or insulating tape built up to not less than 150 percent of insulation rating of conductor.
  - 1. Apply varnished cambric tape over connections where re-entry is likely, such as motor lead connections.
  - 2. Use rubber insulating tape in half-lapped layers to develop the basic insulation over splices and taps.
  - 3. Use vinyl plastic tape in half-lapped layers to provide the outer protective covering over splices and taps.
- C. Insulate cylinder shaped splices and taps, connector barrels and adapter barrels using heat shrinkable insulating tubing, insulating covers manufactured for the connector, or tape insulation as described above.

### 3.7 IDENTIFICATION

- A. Identify wire and cable under provisions of Section 26 05 53, Identification for Electrical Systems.
- B. Identify each conductor with its circuit number or other designation indicated on Drawings.
- C. Apply color coding tape on conductors at each termination, splice, junction, and pull box.
- D. Post conductor color code on each panelboard, switchboard, switchgear assembly, motor control center, dry-type transformer, safety switch, and separate motor controller. Use type-written, adhesive-backed labels

### 3.8 FIELD QUALITY CONTROL

- A. Observe conductors and cables during the installation process.
  - 1. Reject and replace entire reels, rolls, or boxes containing conductors or cables with material or manufacturing defects.
  - 2. Reject and replace cable or conductor segments that have been kinked, dented, or otherwise damaged during handling or installation.
- B. After installation of wires and cables and before electrical circuit is energized, show product capability and compliance with requirements and verify by documented inspections and tests.
- C. Perform the following inspections:
  - 1. Inspect conductors and cables for:
    - a. Freedom from material defect or physical damage,
    - b. Correct conductor size, material, and insulation type,
    - c. Correct color coding and identification.
  - 2. Inspect connections for:
    - a. Correct connector size and type according to the Specifications,
    - b. The use of the correct compression dies and the correct number of crimps on compression connectors in accordance with the connector manufacturer's instructions.
- D. Perform the following tests:
  - 1. Before connecting conductors to equipment, use a megohm meter in a 1-minute test to verify the insulation integrity of each service conductor, feeder conductor with respect to ground and other conductors in the same raceway.
    - a. Use 1000-volts dc to test conductors rated 600 VAC.
    - b. Conductors with insulation resistances over 50 megohms are acceptable.
    - c. Conductors with insulation resistances less than 2 megohms are defective. Remove and replace as necessary with no cost to owner.
    - d. If the conductor insulation resistance is between 50 megohms and 2 megohms notify the project electrical engineer and investigate the conductor installation.

2. After terminating conductors to equipment, test continuity and correct connection of each power circuit conductor and each control circuit conductor.
3. Measure and record the tightness of not less than 10% of each size and type of mechanical or bolted connection using a calibrated torque wrench or torque screwdriver.
  - a. Compare measured torque with torque recommended by the connector manufacturer or UL Standard 486A-486B.
  - b. If any connection is found to be less than 90% of the recommended torque, notify the project electrical engineer and re-torque all bolted connections on the piece of equipment affected.
- E. Remove and replace defective, incorrect, or improperly installed conductors and connectors. Re-inspect and re-test replacement conductors and connectors.
- F. Submit test and inspection records to the project electrical engineer.
- G. Refer to Section 26 08 13, Electrical Acceptance Testing for other inspections and tests that are required before conductors may be energized.

END OF SECTION 26 05 19

## SECTION 26 05 26

### GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

#### PART 1 GENERAL

##### 1.1 SECTION INCLUDES

- A. Circuit and System Grounding
- B. Enclosure and Equipment Grounding System

##### 1.2 SUBMITTALS

- A. Submit the following:
  - 1. Catalog Data: Submit catalog data for grounding conductors, grounding clamps, grounding bushings, grounding plates, grounding bars, exothermic weld materials, compression grounding connector materials, static grounding materials.
  - 2. Submit seven (7) copies of data to project electrical engineer.

##### 1.3 REGULATORY REQUIREMENTS

- A. Comply with the National Electrical Code (NEC) for components and installation.
- B. Provide products that are listed and labeled for the application and environment in which installed.

##### 1.4 RECEIVING, STORING AND PROTECTING

- A. Receive, store, and protect, and handle products according to NECA 1 Standard Practices for Good Workmanship in Electrical Construction.

#### PART 2 PRODUCTS

##### 2.1 PRODUCT OPTIONS AND SUBSTITUTIONS

- A. Alternate products may be accepted; if submitted to and approved by project electrical engineer.

##### 2.2 EQUIPMENT GROUNDING CONDUCTORS

- A. Provide listed THHN/THWN insulated copper wire.

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- B. Use solid grounding conductors 10 AWG and smaller where not subject to vibration or repeated flexing.
- C. Use stranded grounding conductors for 8 AWG and larger.
- D. Use stranded grounding conductors where subject to vibration or repeated flexing. Use stranded grounding conductors in flexible conduit at motor connections.
- E. Color code grounding conductors as follows:
  - 1. Equipment ground:
    - a. Conductors 6 AWG and smaller: Green colored insulation.
    - b. Conductors 4 AWG and larger: Green colored insulation or black colored insulation with 3/4 inch wide band of water and oil-resistant green plastic adhesive tape.

### 2.3 GROUND BAR

- A. Provide ground bar, 12 inches long or greater length as indicated on the drawings, fabricated from 1/4 inch thick, 4 inch wide copper stock with (1" + 3/4") x 2" bolt hole pattern to accept NEMA standard lugs. Mount ground bar on 2700 volt standoff insulators.
- B. Provide 25 ft 4/0 AWG copper pigtail exothermically welded to the ground bar.
- C. Manufacturer: Harger "GBIT" or equivalent.

### 2.4 PIPE GROUNDING CONNECTORS

- A. Provide listed copper-alloy connectors for making cable to pipe connections.
- B. Manufacturer: O-Z/Gedney "ABG" or "CG" ..

### 2.5 CONDUIT GROUNDING BUSHINGS

- A. Provide listed, galvanized malleable iron, 150 C rated insulated throat grounding bushings with lay-in type ground cable lugs.
- B. Manufacturers: O-Z/Gedney Type "BLG" or equivalent.

### 2.6 COMPRESSION GROUNDING CONNECTIONS

- A. Provide wrought copper connectors, terminals, taps, and splices for making irreversible compression grounding connections.
- B. Provide connector manufacturer's hydraulic compression tools and dies that match the connectors.

- C. Match connector and die size to material shapes and conductor sizes to be joined.
- D. Use two-hole heavy-duty compression lugs for bolted connections to ground bars, ground plates, and equipment ground pads.
- E. Manufacturer: Burndy "Hyground"

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Verify that work of other trades likely to damage grounding and bonding material has been coordinated to prevent damage to electrical equipment.
- B. Electrode locations and grounding cable routing shown on Drawings are approximate unless dimensioned.
  - 1. Install electrodes and route cable as required meeting project conditions.
  - 2. Where electrode location or cable routing is not shown, and destination only is indicated, determine exact locations, routing, and lengths required to meet project conditions.

### 3.2 PREPARATION

- A. Examine equipment and building finishes that are to receive grounding and bonding material for compliance with installation tolerances and other conditions. Do not proceed with installation until unsatisfactory conditions have been corrected.

### 3.3 EXISTING WORK

- A. Remove exposed abandoned grounding and bonding material, including that abandoned above accessible ceiling finishes. Patch surfaces where grounding and bonding materials are removed.
- B. Disconnect abandoned grounding and bonding systems and remove.
- C. Provide access to existing grounding and bonding connections remaining active and requiring access. Modify installation or install access panel.
- D. Extend existing grounding and bonding systems using materials and methods of like kind or as specified.

### 3.4 GENERAL

- A. Comply with the requirements of the NEC, this Section and the Drawings.

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- B. Install grounding and bonding material according to manufacturer's instructions. Have the manufacturer's installation instructions available at the construction site.
- C. Use the following connection methods unless otherwise specified or indicated on the Drawings:
  - 1. Use exothermic weld grounding connections for concealed connections of dissimilar materials.
  - 2. Use exothermic weld or connections for concealed connections of like materials.
  - 3. Use compression, or bolted grounding connections for accessible connections.
  - 4. Make bolted connections using bolts, nuts, flat washers, and toothed lock washers suitable for the connector and the installation environment; acceptable materials include high strength silicon bronze and 18-8 alloy stainless steel.
  - 5. Make irreversible bolted connections using 18-8 alloy stainless steel tamper-resistant bolts and tamper-resistant nuts along with flat washers, and toothed lock washers. Tamper-resistant nuts and bolts must resist loosening with common tools; acceptable tamper-resistant fasteners include penta-head, break-away, and oval designs.
- D. Tighten grounding and bonding connectors and terminals, including screws and bolts, in accordance with manufacturer's published torque tightening values for connectors and bolts. Where manufacturer's torquing requirements are not indicated, tighten connections to comply with torque tightening values specified in UL 486A and UL 486B. Use a calibrated torque wrench.
- E. Use hydraulic compression tools to provide the correct circumferential pressure for compression connectors. Follow connector manufacturer's installation instructions and use tools and dies recommended by the manufacturer of the connectors. Provide embossing die code or other standard method to make a visible indication that a connector has been adequately compressed.
- F. Install exothermic welds in accordance with manufacturer's instructions and recommendations. Welds that are puffed up or that show convex surfaces indicating improper cleaning are not acceptable.
- G. Make connections in such a manner as to minimize possibility of galvanic action or electrolysis. 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 assure high conductivity.
  - 2. Make connections with clean bare metal at points of contact.

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3. Make aluminum to galvanized steel connections with tin-plated copper jumpers and mechanical clamps.
  4. Coat and seal connections involving dissimilar metals with inert material to prevent future penetration of moisture to contact surfaces.
- H. Comply with requirements in Section 26 0529, Hangers and Supports for Electrical Systems.

### 3.5 ENCLOSURE AND EQUIPMENT GROUNDING

- A. Provide permanent and effective equipment, enclosure, and raceway grounding in accordance with NEC requirements and as further specified or shown on the Drawings.
- B. Provide an equipment ground bar, separate from any neutral bar, in all switchgear, switchboards, panelboards, transformers, motor control centers, starters, disconnect switches, cabinets, etc., for grounding the enclosure and for connecting other equipment and raceway ground conductors. Make connections to the ground bar using mechanical lugs or compression lugs.
- C. Make connections and couplings on metallic conduit systems wrench tight.
- D. Bonding Bushings:
1. Install bonding bushings on metallic conduit containing circuits rated 100 amperes and higher.
  2. Install bonding bushings on metallic conduits entering enclosures through concentric, eccentric or oversize knockouts.
  3. Install bonding bushings on metallic conduits that terminate to a metallic enclosure without effective electrical connection such as locknuts or threaded bushings.
  4. Bond conduit bonding bushing lug to the equipment ground bar or ground lug in switchgear, panelboards, transformers, motor control centers, starters, disconnect switches, cabinets, etc. Size bonding jumpers in accordance with the NEC.
- E. Provide an insulated equipment grounding conductor for each feeder and branch circuit.
1. Install the grounding conductor within the common conduit or raceway with the related phase and neutral conductors and connect to the grounding terminal or grounding bus in each box or cabinet.
  2. Size equipment ground conductor in accordance with the NEC or as shown on the Drawings.

#### Grounding and Bonding for Electrical Systems

- F. In each 15 or 20 ampere branch circuit outlet box and junction box, install a green colored washer head grounding screw with a 12 AWG equipment grounding conductor pigtail.
- G. Connect receptacle grounding terminals to the equipment ground system using minimum 12 AWG equipment grounding conductor. Do not use a "self-grounding" receptacle strap as the only equipment grounding path.

### 3.6 FIELD QUALITY CONTROL

- A. General: Perform on-site verification, certification and acceptance testing of the grounding installation during construction. Verification and testing will be witnessed by designated project electrical engineer representatives.
- B. Notify the project electrical engineer five (5) working days in advance of the expected completion of a grounding system installation. Verification and testing can be scheduled in parts or by area depending on the system and construction schedule.
  - 1. Test equipment ground resistances for the following items. Measure resistance between the equipment item and the Main Ground Electrode Ground Bar. Use the "two-point method" of IEEE Std. 81. Investigate and correct equipment ground resistances that exceed 0.5 ohm.
    - a. Switchgear and Switchboards
    - b. Panelboards
    - c. Motor Control Centers
    - d. Motors larger than 1 HP

END OF SECTION

## SECTION 26 05 29

### HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

#### PART 1 GENERAL

##### 1.1 SECTION INCLUDES

A. Furnish and install, hangers, supports, anchors, concrete bases, and other positive fastenings for non-structural electrical components such that gravity loads are safely transferred to the structure.

1. Conduits:
  - a. All conduits.
  - b. Individually supported conduits larger than 2-1/2 inches.
2. Enclosed circuit breakers and safety switches.
3. Enclosed controllers and panels:
  - a. All VFD enclosed controllers and control panels
4. Luminaries:
  - a. All luminaries and exit signs.
5. Motors:
  - a. All Motors
6. Panelboards.
7. Wireways: All

In addition, ASCE-7 requires designed anchors for:

8. Supports that are cantilevered up from the floor.
9. Supports that are constructed as rigid welded frames.
10. Attachments using spot welds, plug welds, or minimum size welds as defined by AISC.

##### 1.2 QUALITY ASSURANCE

A. Furnish and install hangers and supports that conform to the requirements of the following adopted codes and standards by the Authority Having Jurisdiction (AHJ):

1. NFPA 70, National Electric Code (NEC)
2. IBC, International Building Code
3. NECA 1, Standard Practices for Good Workmanship in Electrical Contracting
4. Metal Framing Manufacturers Association
  - a. MFMA-4, Metal Framing Standards Publication
  - b. MFMA-102, Guidelines for the Use of Metal Framing

### HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

### 1.3 SUBMITTALS

- A. Submit the following.
  - 1. Catalog Data: Submit catalog data for each type of product specified. Include information substantiating equivalent corrosion resistance to zinc coated steel of alternative treatment, finish, or inherent material characteristic.
  - 2. Test reports: Submit ICC Evaluation Service, Inc evaluation report for each post-installed concrete or masonry anchor product showing that it complies with the current edition of the IBC and the intended conditions of use.
  - 3. Provide seven (7) copies of data to project electrical engineer.

### 1.4 RECEIVING, STORING AND PROTECTING

- A. Receive, store, and protect, and handle products according to NECA 1.

## PART 2 PRODUCTS

### 2.1 SUBSTITUTIONS

- A. Alternate products may be accepted by submittal and approval in writing by the Project Resident Electrical Engineer.

### 2.2 COATINGS AND MATERIALS

- A. Furnish products for use indoors protected with zinc coating or with treatment of equivalent corrosion resistance using approved alternative treatment, finish, or inherent material characteristic.
- B. Furnish products for use outdoors or in damp or corrosive indoor locations with hot-dip galvanized coating or with treatment of equivalent corrosion resistance using approved alternative treatment, finish, or material such as stainless steel with inherent corrosion resistant characteristics.

### 2.3 RACEWAY SUPPORTING DEVICES

- A. Furnish supports for the installation of raceway systems.
- B. Run conduits along roof area with raceway roof-supports ERICO CADDY series.

## PART 3 EXECUTION

### 3.1 GENERAL

- A. Install supports according to the NEC, IBC, NECA 1, the requirements in this Section, and specific supporting requirements in other Sections.
- B. Conform to manufacturer's instructions and recommendations for selection and installation of hangers and supports.

## HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

- C. Do not use wire or perforated strap for permanent supports.
- D. Install flexible Sections in electrical conduits and raceways where they cross expansion joints and where they connect to equipment with seismic controls or vibration isolators. Refer to Section 26 05 33 - Raceways and Boxes for Electrical Systems.
- E. Do not support conduits, boxes, raceways, etc. from ceiling suspension wires.

### 3.2 EXAMINATION

- A. Examine surfaces to receive supports for compliance with installation tolerances and other conditions affecting performance of the system. Do not proceed with installation until unsatisfactory conditions have been corrected.

### 3.3 FASTENERS

- A. Pre-set inserts: Install pre-set inserts for anchoring to roof.
- B. Masonry screw anchors: Use in accordance with NECA 1 and the product's ICC-ES report conditions of use.
- C. Use wood screws for fastening to wood construction.
- D. Use beam clamps or machine bolts, nuts, and washers for fastening to metal.
- E. Torque threaded fasteners as recommended by the manufacturer's instructions.

### 3.4 RACEWAY SUPPORTS.

- A. Install individual and multiple raceway supports as necessary to support raceways. Provide U-bolts, clamps, attachments, and other hardware necessary for securing conduits.
- B. Support three or more parallel runs of horizontal raceways together on common supports.
- C. Support individual horizontal raceways by separate supports.
- D. Do not support conduits from ceiling suspension wires.

### 3.5 BOXES AND CABINETS

- A. Support sheet metal boxes directly from the building structure, or by approved brackets or bar hangers, as shown on the Drawings or as required. Where bar hangers are used, attach the bar to structure on opposite sides of the box.
- B. In open overhead spaces, cast boxes threaded to raceways need not be supported separately except where used for fixture support.
- C. Install surface-mounted cabinets and panelboards as shown on the Drawings or as required.

## HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

### 3.6 FRAMING CHANNEL SYSTEMS

- A. Select and install framing channel systems in accordance with MFMA-103.
- B. Use framing channel to support electrical equipment that is mounted free of walls.
- C. Use framing channel to support equipment mounted on walls that do not have sufficient strength to resist pull-out or wallowing out of equipment mounting bolts.

END OF SECTION 26 05 29

## SECTION 26 05 33 - RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

### PART 1 GENERAL

#### 1.1 SECTION INCLUDES

- A. Conduits and fittings
- B. Outlet boxes
- C. Pull and junction boxes
- D. Floor boxes
- E. Surface metal raceways
- F. Wireway

#### 1.2 SUBMITTALS

- A. Submit the following in accordance with Section 01 3300, Submittal Procedures:
  - 1. Catalog Data: Submit catalog data describing floor boxes. Include data substantiating that materials comply with specified requirements.
  - 2. Catalog Data: Submit catalog data describing all wireways boxes, etc. Include data substantiating that materials comply with specified requirements.
  - 3. Submit seven (7) copies of submittals to project electrical engineer.

#### 1.3 QUALITY ASSURANCE

- A. Comply with the *National Electrical Code (NEC)* for components and installation.
- B. Provide products that are listed and labeled for the application, installation condition, and the environment in which installed.

#### 1.4 RECEIVING, STORING, AND PROTECTING

- A. Receive, store, and protect, and handle products according to NECA 1 – *Standard Practices for Good Workmanship in Electrical Construction*.

### Raceways and Boxes For Electrical Systems

## PART 2 PRODUCTS

### 2.1 PRODUCT OPTIONS AND SUBSTITUTIONS

- A. Alternate products may be accepted; upon submittal of seven (7) copies and approval by project electrical engineer.

### 2.2 COATINGS

- A. Provide products with zinc coating or with treatment of equivalent corrosion resistance using approved alternative treatment, finish, or inherent material characteristic that is suitable for the environment in which the product will be installed and used.

### 2.3 RIGID METAL CONDUIT AND FITTINGS (RMC)

- A. Furnish rigid metal conduit (RMC) that meets the requirements of UL6 – *Rigid Metal Electrical Conduit*, NEMA C80.1 – *Electrical Rigid Steel Conduit (ERSC)*.
- B. Furnish zinc-plated, threaded, malleable iron fittings and conduit bodies that meet the requirements of UL514B and ANSI/NEMA FB1.

### 2.4 FLEXIBLE METAL CONDUIT AND FITTINGS

- A. Furnish galvanized steel flexible metal conduit that meets the requirements of UL1 – *Flexible Metal Electrical Conduit*.
- B. Furnish zinc-plated malleable iron fittings that meet the requirements of UL514B – *Fittings for Conduit and Outlet Boxes*, and ANSI/NEMA FB1 – *Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies*. Furnish insulated throat connectors.

### 2.5 INSULATING BUSHINGS

- A. Provide listed insulating bushings with 105 °C rated insulation.
- B. Manufacturer: O-Z/Gedney, Type IB or equivalent.

### 2.6 GROUNDING BUSHINGS

- A. Provide NRTL listed, galvanized malleable iron, 150 °C rated insulated throat grounding bushings with lay-in type ground cable lugs.
- B. Manufacturer: O-Z/Gedney, Type BLG or equivalent.

## 2.7 EXPANSION FITTINGS

- A. Furnish NRTL listed expansion fittings with hot dipped galvanized malleable iron body, factory installed packing and a bonding jumper.
- B. Manufacturer: O-Z/Gedney, Type AX, TX or EXE with Type BJ bonding jumper or equivalent.

## 2.8 CORROSION PROTECTION TAPE

- A. Furnish pressure-sensitive, 10 mil thick. PVC based tape for corrosion protection of metal conduit and fittings.
- B. Manufacturer: 3M, Type 50 or equivalent.

## 2.9 WIREWAY

- A. Provide listed, raintight type wireway with covers, elbows, tees, hangers and fittings required for a complete system.
- B. Supply wireway with manufacturer's standard knockouts.
- C. Manufacturer: Square D "Square –Duct" or equivalent.

## 2.10 PULL AND JUNCTION BOXES

- A. For damp or wet, non-corrosive locations, in conduit runs 3/4 inch trade size, provide 4-11/16 inches square, 2-11/16 inches deep cast malleable iron pull and junction boxes with threaded hubs and gasketed cast malleable iron or cast copper-free aluminum covers.
- B. For damp or wet, non-corrosive locations, in conduit runs 1 inch trade size and larger, provide galvanized sheet-steel pull and junction boxes and covers that comply with UL 50 Type 3R.
- C. Provide connection points for equipment grounding conductors in each box.

## PART 3 EXECUTION

### 3.1 EXISTING WORK

- A. Remove all exposed abandoned raceways, to the point that non-removable building construction (e.g. concrete or masonry) covers the raceway. Cut raceways flush with non-removable building construction.
- B. Disconnect abandoned outlets and remove devices. Remove abandoned outlets when raceway is abandoned and removed. Install blank cover for abandoned outlets not removed.

#### Raceways and Boxes For Electrical Systems

- C. Cap, plug, or seal remaining raceway openings to restore the original fire rating of floors, walls, and ceilings after electrical demolition. Patch surfaces to match existing.
- D. Maintain access to existing boxes and other installations remaining active and requiring access. Modify installation or provide access panel.
- E. Extend existing raceway and box installations using materials and methods as specified.
- F. Clean and repair existing raceway and boxes to remain or to be reinstalled.

### 3.2 EXAMINATION

- A. Examine surfaces to receive raceways and boxes for compliance with installation tolerances and other conditions affecting performance of the raceway system. Do not proceed with installation until unsatisfactory conditions have been corrected.

### 3.3 GENERAL

- A. Install complete systems of raceways and boxes for wiring systems.
- B. Install raceways and boxes according to NECA 1 – *Standard Practices for Good Workmanship in Electrical Construction*, NECA 101 – *Standard for Installing Steel Conduits (Rigid, IMC, EMT)*, NECA 111, the NEC, the manufacturer's instructions, and requirements in this Section.
- C. Raceway termination points and box locations shown on the Drawings are in approximate locations unless dimensioned. Verify locations before rough-in.
- D. Raceway routing is shown on the Drawings in approximate locations unless dimensioned. Coordinate routing with structure and with work of other trades. Route as required for a complete wiring system.
- E. Ground and bond raceways and boxes as required in Section 26 0526 – *Grounding and Bonding for Electrical Systems*.
- F. Support raceways and boxes in accordance with the requirements the National Electrical Code, Section 26 0529 – *Hangers and Supports for Electrical Systems*.
- G. Identify raceways and boxes as required in Section 26 0553 – *Identification for Electrical Systems*.
- H. Arrange raceway and boxes to maintain headroom and present neat appearance.
- I. Install knockout closures in unused openings in boxes or raceways.

## Raceways and Boxes For Electrical Systems

### 3.4 CONDUIT INSTALLATION

- A. For low-voltage wiring systems (less than 1000 volts) use conduit materials according to the NEC and the following:
  - 1. Outdoors - exposed: Use RMC.
  - 2. Outdoors locations: Use galvanized RMC and fittings.
  - 3. Indoors – exposed outside of designated electrical rooms:
    - a. Exposed to physical damage during or after installation: Use RMC.
    - b. Exposed to moisture: Use RMC.
  - 4. Connection to vibrating equipment (including transformers and hydraulic, pneumatic, or electric solenoid or motor-driven equipment) – Use a minimum of 24 inches; maximum length as determined by the NEC.

### 3.5 FIRESTOPPING

- A. Install an approved firestop system at each electrical penetration in a fire-rated wall, floor or partition.
- B. At least 2 days prior to firestopping installation, notify project electrical engineer so that arrangements can be made for inspection during installation. Do not proceed with the firestopping installation unless project electrical engineer is present.

### 3.6 PULL AND JUNCTION BOX INSTALLATION

- A. Install pull and junction boxes as shown on the Drawings and as required for splices, taps, wire pulling, and compliance with regulatory requirements.
- B. Install pull boxes as required to comply with limits on conduit bends and distance between pull points in the CONDUIT INSTALLATION article of this Section.
- C. Install indoor pull and junction boxes in accessible locations in unfinished spaces. Position boxes so covers can be removed. Place boxes to maintain headroom.

### 3.7 WIREWAY INSTALLATION

- A. Install wireways at locations indicated on the drawings
- B. Mount plumb and level.

### 3.8 SURFACE METAL RACEWAY INSTALLATION

- A. Install surface metal raceway at locations indicated on the drawings
- B. Use flat-head screws, clips and straps to fasten raceway channel to surfaces
- C. Mount plumb and level.

### 3.9 ADJUSTING

- A. Adjust flush-mounted outlets to make front flush with finished floor, wall or ceiling material.
- B. Install knockout closures in unused openings in boxes.

### 3.10 CLEANING

- A. Clean interior of boxes to remove dust, debris, and other material.
- B. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
- C. Repair damage to paint finishes with matching touch-up coating recommended by the manufacturer.

### 3.11 FIELD QUALITY CONTROL

- A. Provide final protection and maintain conditions to ensure that coatings and finishes are without damage or deterioration at final inspection.

END OF SECTION

## SECTION 26 05 53 - IDENTIFICATION FOR ELECTRICAL SYSTEMS

### PART 1 GENERAL

#### 1.1 SECTION INCLUDES

- A. Component identification tags.
- B. Equipment nameplates.
- C. Wire markers.
- D. Voltage markers.
- E. Warning signs.
- F. Arc flash and shock hazard warning labels.
- G. Working space markers.
- H. Underground warning tape.
- I. One-line diagrams and operating instructions.

#### 1.2 SUBMITTALS

- A. Submit the following in accordance with Section 01 33 00 Submittal Procedures:
  - 1. Catalog Data: Submit manufacturer's catalog literature for each product.
  - 2. Submit electrical identification schedule including list of wording, symbols, letter size, color coding, tag number, location, and function.
  - 3. Provide project electrical engineer with seven (7) copies of contractor submittals.
  - 4. Samples:
    - a. Submit two samples of each type of printed identification products applicable to project.
    - b. Submit two nameplates illustrating materials and engraving quality.
  - 5. Manufacturer's Installation Instructions: Submit installation instructions, indicating special procedures and installation requirements.

#### 1.3 REGULATORY REQUIREMENTS

- A. Conform to requirements of the National Electrical Code (NEC), NFPA 70E, and OSHA Codes adopted by the Authority Having Jurisdiction (AHJ).
- B. Conform to applicable requirements of the following ANSI Standards:

### IDENTIFICATION FOR ELECTRICAL SYSTEMS

1. Z535.1 Safety Color Code.
2. Z535.2 Environmental and Facility Safety Signs.
3. Z535.3 Criteria for Safety Symbols and Labels.
4. Z535.4 Product Safety Signs and Labels.
5. Z535.5 Safety Tags and Barricade Tapes (for Temporary Hazards).

#### 1.4 COORDINATION

- A. Coordinate identification names, abbreviations, colors, and other features with requirements in the Subcontract Documents, Shop Drawings, and manufacturer's wiring diagrams, with those required by codes, standards, and 29 CFR 1910.145. Use consistent designations throughout Project.
- B. Verify electrical equipment designations with project electrical engineer through the Subcontract Technical Representative.

### PART 2 PRODUCTS

#### 2.1 PRODUCT OPTIONS AND SUBSTITUTIONS

- A. Alternate products or "approved equal" is always implied after a brand name, patented process or catalog number. The Subcontractor may substitute any brand or process approved as an equal by the specifying Architect/Engineer through the submittal process. The only exception is where "no substitution" is specified. See General Provision "Material and Workmanship".
  1. If the Bidder would like to provide a bid for material, other than the material specified (henceforth, a "substitution"), the Bidder shall submit a Request for Information (RFI) in writing to the Resident Electrical Engineer, with a copy to the Procurement Officer. The Resident Electrical Engineer will determine whether the proposed alternatives comply with the specifications. The Resident Electrical Engineer's decision shall be final and in writing.
  2. RFI's shall be submitted to "Sun Engineering", by e-mail at [jmattei@sunengineering.us](mailto:jmattei@sunengineering.us), with a copy to the Procurement Officer, no later than seven (7) calendar days prior to the currently scheduled bid due date and time. REQUEST RECEIVED AFTER THIS TIME WILL NOT BE CONSIDERED.
  3. Burden of proof as to equality of products or materials requested for substitution is upon Bidder requesting substitution. All manufacturers' materials submitted for prior approval shall be compatible with, and have the capability of tying into, existing systems where they occur. Contractor shall pay for all adaptations required in the use of all approved substituted products or materials.
  4. Bids received for alternative equipment or material that have not been accepted by the Engineer as equal through the above-stated Substitution Request process will be rejected.
- B. Component Identification TAGS

#### IDENTIFICATION FOR ELECTRICAL SYSTEMS

- C. Furnish component identification tags as specified below to identify electrical equipment using the system designation, equipment identification, tech area number, and building number.
- D. Coordinate electrical component identification tag schedule with final equipment identification scheme for project.
- E. Provide component identification tags with black letters on yellow background with 2 inches by 3 inches dimensions.
- F. Provide minimum 48 point size lettering.
- G. Provide tags made of the following material:
  - 1. Type 1:
    - a. Two-ply plastic nameplate with letters engraved through yellow surface showing black core.
    - b. Provide UV stabilized material for outdoor applications.
    - c. Manufacturer: Seton Nameplate Corp or approved equivalent.

## 2.2 EQUIPMENT NAMEPLATES

- A. Furnish equipment nameplates as specified below and scheduled on the Drawings to indicate the following information:
  - 1. Category I nameplates:
    - a. Served by nameplates: circuit directory information including circuit number, equipment identification, and location of equipment serving the item, plus the voltage, number of phases, and number of wires.
    - b. Serves nameplates: circuit directory information including circuit number, equipment identification, and location of equipment served, plus the voltage, number of phases, and number of wires.
- B. Coordinate equipment nameplate schedule with equipment numbering scheme provided by Subcontract Technical Representative.
- C. Provide nameplates made of the following materials:
  - 1. Type 1:
    - a. Two-ply plates with letters engraved through surface color showing core color.
    - b. Use UV stabilized material for outdoor applications.
    - c. Manufacturer: Seton Nameplate Corp or approved equivalent.
- D. Provide 10 point minimum size lettering.
- E. Provide colors as follows:
  - 1. Category II nameplates: white letters on black background.

### IDENTIFICATION FOR ELECTRICAL SYSTEMS

- F. Dimensions shall be as follows:
  - 1. Nameplates: 1 inch by 2 ½ inch minimum.

### 2.3 WIRE MARKERS

- A. Provide wire markers for power, control, instrumentation, alarm, and communication circuit wires.
- B. Furnish split sleeve, heat-shrinkable sleeve, or self-laminating adhesive wire markers.
- C. Locate a wire marker on each conductor at switchgear, panelboards, pull boxes, outlet and junction boxes, and each load connection.
- D. Provide typewritten lettering on wire markers as follows:
  - 1. Power and lighting circuits: as-built branch circuit or feeder circuit number.
  - 2. Control circuits: as-built control wire number indicated on schematic and interconnection diagrams or equipment manufacturer's wiring diagrams.
- E. Manufacturer: LEM Products, Inc., Brady, Panduit or approved equivalent.

### 2.4 VOLTAGE MARKERS

- A. Furnish voltage markers for transformers, switchgear, panelboards, starters, motor control centers, safety switches, pull boxes, cabinets, and conduits.
- B. Provide flexible pressure sensitive vinyl markers with minimum 1 inch X 4 inches orange background and black letters.
- C. Provide voltage markers with lettering indicating the highest voltage present:
  - 1. 208Y/120 volt system: 208 VOLTS
  - 2. 120/240 and 240 volt system: 240 VOLTS
  - 3. 480Y/277 and 480 volt system: 480 VOLTS
- D. Manufacturer: Electromark, LEM Products, Inc or approved equivalent.

### 2.5 WIRING SYSTEM COLOR CODE LABELS

- A. In buildings with more than one voltage system, provide wiring system color code labels on each new control panel, panelboard, switchboard, switchgear, and motor control center.
- B. Provide labels with white, 10-point minimum size lettering on a black background.
- C. Provide labels of the following materials:
  - 1. Outdoor labels shall be suitable for a high-UV environment.

#### IDENTIFICATION FOR ELECTRICAL SYSTEMS

2. Provide machine-produced custom labels printed using a thermal transfer process:
  - a. Use polyester label stock that is UL969 listed, *Marking and Labeling Systems*, and has a high adhesion adhesive back.
  - b. Use printing ribbon recommended by the label stock manufacturer.
3. Use a suitable label-printing machine to generate labels.
4. Manufacturer: Brother, Seton, Brady or approved equivalent.

## 2.6 WARNING SIGNS

- A. Furnish warning signs for low-voltage, switchgear, panelboards, motor starters, motor control centers, safety switches, pull boxes, and cabinets.
- B. Use warning signs that conform to ANSI Z535.4 and OSHA Danger and Caution specifications.
- C. Provide minimum 2 inches X 4 inches warning signs.
- D. Provide warning signs with format and lettering as follows:
  1. Signal word: DANGER
  2. Signal word panel color: red with safety alert symbol.
  3. Word message:
    - a. Keep Out!
    - b. Hazardous voltage inside
    - c. Will shock, burn, or cause death.
  4. Safety symbol: ISO 3864 "lightning bolt" in yellow triangle.
- E. Materials:
  1. For indoor applications use flexible, pressure sensitive, polyester base with polyester over laminate.
  2. For outdoor applications use aluminum signs.
- F. Manufacturer: Seton Name Plate Co., Safety Label Solutions, Hazard Communication Systems, Electromark or approved equivalent.

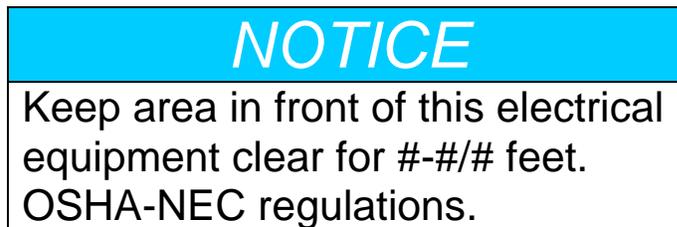
## 2.1 WORKING SPACE FLOOR MARKING

- A. Provide black paint and white paint to mark the NEC-required working space on the floor at electrical equipment that is likely to require examination, adjustment, servicing, or maintenance while energized (match existing floor markings).

### IDENTIFICATION FOR ELECTRICAL SYSTEMS

## 2.2 WORKING SPACE LABELS

- A. Provide labels indicating required working clearance at electrical equipment that is likely to require examination, adjustment, servicing, or maintenance while energized and it is impractical mark the NEC-required working space on the floor
- B. Material:
  - 1. Use polyester label stock that is UL969 listed, *Marking and Labeling Systems*, and has a high adhesion adhesive back.
  - 2. Use printing ribbon recommended by the label stock manufacturer.
  - 3. Use a suitable thermal transfer process label-printing machine to generate labels and enter the application-specific information
  - 4. Outdoor labels shall be suitable for a high-UV environment.
- C. Minimum dimensions: 3-1/2 x 1-1/4 inches.
- D. Use the following label design:



- 1. Signal word: "NOTICE" in 24 point minimum white italic letters on safety blue panel.
- 2. Word message: 16 point minimum black or safety blue letters on white background.
  - a. Word message for 120/240-volt and 208Y/120-volt equipment: "Keep area in front of this electrical equipment clear for 3 feet. OSHA-NEC regulations."
  - b. Word message for 480-volt and 480Y/277-volt equipment with exposed live parts on one side of the working space and no live parts on the other side of the working space: "Keep area in front of this electrical equipment clear for 3-1/2 feet. OSHA-NEC regulations."
  - c. Word message for 480-volt and 480Y/277-volt equipment with exposed live parts on both sides of the working space: "Keep area in front of this electrical equipment clear for 4 feet. OSHA-NEC regulations."
- E. Manufacturer: Brother, Seton, Brady or approved equivalent

## PART 3 EXECUTION

### 3.1 EXISTING WORK

- A. Install identification on existing equipment to remain in accordance with this Section.
- B. Install identification on unmarked existing equipment to remain.

#### IDENTIFICATION FOR ELECTRICAL SYSTEMS

- C. Replace lost nameplates.

### 3.2 EXAMINATION

- A. Examine surfaces to receive identification products for compliance with installation tolerances and other conditions affecting performance of the identification products. Do not proceed with installation until unsatisfactory conditions have been corrected.

### 3.3 INSTALLATION - GENERAL

- A. Where identification is to be applied to surfaces that require finish, install identification after completion of finish work.
- B. Install labels where indicated and at locations for best convenience of viewing without interference with operation and maintenance of equipment.
  1. Coordinate installation of identifying devices with location of access panels and doors.
  2. Install identifying devices before installing acoustical ceilings and similar concealment.
- C. Install electrical identification products only when ambient temperature and humidity conditions for adhesive are within range recommended by manufacturer.
- D. Clean surface where electrical identification product is to be placed.
- E. Use manufacturer's recommended adhesive for engraved tags and nameplates.
- F. Place electrical identification products centered and parallel to equipment lines.

### 3.4 COMPONENT IDENTIFICATION TAGS

- A. Install component identification tag on the front of each piece of electrical equipment including, panelboards, motor control centers, motor controllers, safety switches.
- B. Position tags so they can be read from floor or ground.

### 3.5 EQUIPMENT NAMEPLATES

- A. Install equipment nameplate or nameplates on the front of each piece of electrical equipment including switchgear, transformers, switchboards, panelboards, motor control centers, motor controllers, safety switches, and enclosed circuit breakers.
- B. Position nameplates so they can be read from floor or ground.

### 3.6 WIRE MARKERS

- A. Install wire markers on power, control and communication conductors at each appearance in locations such as pull boxes, outlet boxes, junction boxes, panelboards, switchgear, motor control centers, VFD's, safety switches, enclosed circuit breakers, and load connections.

## IDENTIFICATION FOR ELECTRICAL SYSTEMS

- B. Position markers so they can be read from the front of the enclosure.

### 3.7 VOLTAGE MARKERS

- A. Install voltage markers at the following locations and position markers so they can be read from floor or ground:
  - 1. Front of each low-voltage, panelboard, control panel, motor control center, enclosed circuit breaker, safety switch, and VFD enclosure, including those furnished with mechanical equipment.
  - 2. Cover of each pull box containing low-voltage conductors.
  - 3. Each 2 inch and larger conduit longer than 6 feet; space markers not more than 20 feet on center.

### 3.8 WARNING SIGNS

- A. Install warning signs at the following locations and position signs so they can be read from floor or ground:
  - 1. Front of each low-voltage, panelboard, industrial control panel, motor control center, enclosed circuit breaker, safety switch, and VFD enclosure including those furnished with mechanical equipment.
  - 2. Cover of each pull box containing exposed low -voltage conductors.

### 3.9 WORKING SPACE FLOOR MARKERS

- A. Install floor marking paint on the floor at the locations listed below to indicate the working space required by the NEC.
  - 1. Front of each low-voltage, panelboard, industrial control panel, motor control center, enclosed circuit breaker, safety switch, and VFD enclosure including those furnished with mechanical equipment.
  - 2. Any other equipment likely to require examination, adjustment, servicing, or maintenance while energized.
- B. Dimensions of working space area shall be as follows:
  - 1. Width: the greater of the width of the equipment or 30 inches.
  - 2. Depth:
    - a. 120/240-volt and 208Y/120-volt equipment: 3 feet
    - b. 480-volt and 480Y/277-volt equipment with exposed live parts on one side of the working space and no live parts on the other side of the working space: 3-1/2 feet.
    - c. 480-volt and 480Y/277-volt equipment with exposed live parts on both sides of the working space: 4 feet.
- C. Thoroughly prepare floor surface to receive paint.

#### IDENTIFICATION FOR ELECTRICAL SYSTEMS

- D. Paint the NEC-required working space area with alternating 3 to 6 inch wide black and white diagonal stripes.

### 3.10 WORKING SPACE LABELS

- A. Install working space labels at the following locations only in cases where it is impractical to mark the NEC-required working space on the floor (e.g. carpeted areas).
  - 1. Front of each meter enclosure, low-voltage, panelboard, industrial control panel, motor control center, enclosed circuit breaker, safety switch, and VFD enclosure, including those furnished with mechanical equipment.
  - 2. Any other equipment likely to require examination, adjustment, servicing, or maintenance while energized.
- B. Position labels so they can be read from floor or ground:

END OF SECTION 26 05 53

## SECTION 26 27 26 - WIRING DEVICE

### PART 1 GENERAL

#### 1.1 SUMMARY

##### A. SECTION INCLUDES

1. Receptacles
2. Snap switches
3. Dimmer switches
4. Wall plates
5. Multi-outlet assemblies
6. Occupancy sensing lighting controls

#### 1.2 SUBMITTALS

##### A. Submit the following in accordance with Section 01 33 00.

1. Product Data

#### 1.3 QUALITY ASSURANCE

- A. Comply with the *National Electrical Code (NEC)*.
- B. Furnish products listed and labeled by a nationally recognized testing laboratory (NRTL) for the application, installation condition, and the environments in which installed.
- C. Manufacturers of products addressed in this Section shall maintain an ISO 9001 certification.

#### 1.4 RECEIVING, STORING, AND PROTECTING

- A. Receive, store, and protect, and handle products according to NECA 1, *Standard Practices for Good Workmanship in Electrical Construction*.

### PART 2 PRODUCTS

#### 2.1 PRODUCT OPTIONS AND SUBSTITUTIONS

- A. Alternate products may be accepted; follow Section 01 60 00 - Products & Substitutions.

## WIRING DEVICES

## 2.2 RECEPTACLES

- A. Provide back and side wired, screw pressure terminal, straight-blade and locking type, receptacles as indicated on the drawings. Receptacles shall meet the performance and design requirements of Federal Specification WC596 and UL Standard 498, *Electrical Attachment Plugs and Receptacles*. Receptacle configurations shall be in accordance with NEMA WD 6.
- B. For 120 volt convenience receptacles connected to general purpose branch circuits provide straight-blade NEMA 5-15R, 15 amperes, 125 volts, grounding duplex receptacles. Receptacle mounting strap, ground terminal, and ground contacts shall be formed from one piece of brass alloy. Manufacturer: Hubbell "HBL5262", or equivalent.
- C. For 120 volt receptacles connected to individual branch circuits provide straight-blade NEMA 5-20R, 20 amperes, 125 volts, grounding duplex receptacles. Receptacle mounting strap, ground terminal, and ground contacts shall be formed from one piece of brass alloy. Manufacturer: Hubbell "HBL5362", or equivalent.
- D. For computer or instrument 120 volt circuit receptacles provide straight-blade NEMA 5-15R, 15 amperes, 125 volts, isolated grounding duplex receptacles with orange triangle on face. Manufacturer: Hubbell "IG5262", or equivalent.
- E. For computer or instrument 120 volt circuit receptacles connected to individual branch circuits provide straight-blade NEMA 5-20R, 20 amperes, 125 volts, isolated grounding duplex receptacles with orange triangle on face. Manufacturer: Hubbell "IG5362", or equivalent.
- F. For ground fault circuit interrupter (GFCI) receptacles provide straight-blade NEMA 5-15R, 15 amperes, 125 volts, grounding, "feed through" type, self-testing GFCI, duplex receptacle that meet the requirements of UL Standard 943, *Ground Fault Circuit Interrupters*. Provide units that can be installed in a 2-3/4-inch deep outlet box without an adapter. Manufacturer: Hubbell "GFR5252ST", or equivalent.
- G. For ground fault circuit interrupter (GFCI) receptacles connected to individual branch circuits provide straight-blade NEMA 5-20R, 20 amperes, 125 volts, grounding, "feed through" type, self-testing GFCI, duplex receptacle that meet the requirements of UL Standard 943, *Ground Fault Circuit Interrupters*. Provide units that can be installed in a 2-3/4-inch deep outlet box without an adapter. Manufacturer: Hubbell "GFR5352ST", or equivalent.

## WIRING DEVICES

- H. For 120 volts, 20 amp circuit outlets serving electric water coolers (EWC) provide straight-blade NEMA 5-20R, 20 amperes, 125 volts, grounding, single receptacles. Receptacle mounting strap, ground terminal, and ground contacts shall be formed from one piece of brass alloy. Manufacturer: Hubbell "HBL5361", or equivalent.
- I. Provide straight-blade and twist lock receptacles for special applications as indicated on the Drawings.

## 2.3 RECEPTACLES, INDUSTRIAL HEAVY DUTY

- A. For NRTL listed equipment furnished with cords and attachment plugs configured to the current edition of NEMA WD 6, provide the corresponding receptacles. Provide receptacles that meet the performance and design requirements of Federal Specification WC596 and UL Standard 498, *Electrical Attachment Plugs and Receptacles*. For equipment not furnished with cords and attachment plugs conforming to NEMA WD 6, provide receptacles and matching plugs as specified below.
- B. For 20, 30, 60, and 100 ampere heavy duty receptacle outlets located in dry, damp, or wet locations provide pin and sleeve type receptacles that are color coded and uniquely configured to the particular circuit voltage and current rating.
- C. Pin and sleeve receptacles shall be NRTL listed to UL Standard 1682, *Plugs, Receptacles, and Cable Connectors of the Pin and Sleeve Type* and UL Classified to IEC Standards 309-1 and 309-2, *Plugs, Socket Outlets, and Couplers for Industrial Purposes*, and Series II rated for voltages and services.
- D. Provide a back box suitable for each particular receptacle device and installation location.
- E. Where indicated on the Drawings provide 20, 30, 60, and 100 ampere pin and sleeve receptacles with safety interlocks that will prevent making or breaking the receptacle connection under load.
- F. For each receptacle provide a matching plug.
- G. Manufacturer: Pass & Seymour "IEC 309 Industrial Products", or equivalent.

## 2.4 RECEPTACLES IN HAZARDOUS (CLASSIFIED) LOCATIONS

- A. Provide receptacles for hazardous locations, as indicated on the drawings, that comply with the requirements of NEMA Standard FB 11, *Plugs, Receptacles, and Connectors of the Pin and Sleeve Type for Hazardous Locations* and UL Standard 1010, *Receptacle-Plug Combinations for Use in Hazardous (Classified) Locations*.

## 2.5 PENDANT/CORD CONNECTOR DEVICES

- A. Provide matching, locking type, plug receptacle body connector, NEMA L5-20P and L5-20R, heavy-duty grade for pendant cords as indicated on the Drawings.

## WIRING DEVICES

- B. Provide connector bodies fabricated from nylon or polycarbonate with screw-open cable-gripping jaws and provision for attaching an external cable grip.
- C. Provide external cable grips of the woven wire mesh type made of high-strength galvanized-steel wire strands, matched to cable diameter and with attachment provision designed for the corresponding connector.
- D. Cord shall be 600 volt insulated, stranded copper conductors, with type SO jacket and rated for 90 degree C. Grounding conductor not less than that required by the NEC and shall have green insulation. Conductor ampacity shall be equipment rating plus 25 percent minimum.

## 2.6 CORD AND PLUG SETS

- A. Provide cord and plug sets that match voltage and current ratings and number of conductors to requirements of the equipment being connected.
- B. Cord shall be 600 volt insulated, stranded copper conductors, with type SO jacket and rated 90 degree C. Grounding conductor not less than that required by the NEC and shall have green insulation. Conductor ampacity shall be equipment rating plus 25 percent minimum.
- C. Plug shall be male configuration with nylon or polycarbonate body and integral cable-clamping jaws. Match to cord and to receptacle type intended for connection.

## 2.7 SNAP SWITCHES

- A. Provide single pole, double pole, three-way, four-way and illuminated handle snap switches as indicated on the Drawings.
- B. Switches shall be rated 20 amperes, 120-277 volts AC, back and side wired, screw pressure terminal, quiet type AC switch with yoke grounding screw. Switches shall meet the performance and design requirements of UL Standard 20, *General Use Snap Switches*, and Federal Specification WS896.
- C. Manufacturer: Hubbell "HBL1220" series, or equivalent.

## 2.8 SNAP SWITCHES IN HAZARDOUS (CLASSIFIED) LOCATIONS

- A. Provide snap switches for hazardous locations that comply with UL Standard 894, *Switches for Use in Hazardous (Classified) Locations*.
- B. Switch shall be rated 20 ampere, 120-277 volt AC, and shall meet the performance and design requirements of NEMA Standard WD 1, *General Purpose Wiring Devices*, Federal Specification WS-896E, and UL Standard 20, *General Use Snap Switches*.
- C. Manufacturer: Appleton "EDS", or equivalent.

## WIRING DEVICES

## 2.9 WALL PLATES

- A. For flush mounted interior receptacles and wall switches, provide 0.032 inch thick (minimum) brushed 302/304 alloy stainless steel smooth wall plates that meet the requirements of Federal Specification WP-455A. Manufacturer: Hubbell "S" series, or equivalent.
- B. For surface mounted interior receptacles and switches, furnish galvanized steel 4 inch square raised surface covers. Receptacles installed in raised covers shall be secured by more than one screw. Manufacturer: RACO "800" series, or equivalent.
- C. For GFCI receptacles in damp locations provide weatherproof, cast aluminum, hinged, self-closing device covers. Manufacturer: Hubbell "WP26" or "WPFS26" , or equivalent.
- D. For GFCI receptacles in wet locations provide cast aluminum, hinged, self-closing device covers that are weatherproof whether or not the attachment plug cap is inserted. Manufacturer: Hubbell "WP26M" or "WP26MH" , or equivalent.
- E. Provide single, multi-gang, and combination type wall plates that mate and match with corresponding wiring devices.
- F. Use metal plate-securing screws to match plate finish.

## PART 3 EXECUTION

### 3.1 PREPARATION

- A. Verify outlet boxes are installed at proper locations and heights.
- B. Verify wall openings are neatly cut and will be completely covered by wall plates.
- C. Verify branch circuit wiring installation is completed, tested, and ready for connection to wiring devices.
- D. Clean debris from outlet boxes before installing devices.

### 3.2 INSTALLATION

- A. Install products following manufacturer's instructions. Have the manufacturer's installation instructions available at the construction site.
- B. Install devices plumb, level, and secure.
- C. Except as otherwise indicated on the Drawings, mount devices flush, with long dimension vertical, and grounding point of receptacles on top. Group adjacent switches and receptacles under single, multi-gang wall plates.

## WIRING DEVICES

- D. Do not use the duplex/split-wire break-off tabs in receptacles as circuit conductors for connecting downstream devices.
- E. Cover devices and assemblies during painting.
- F. Install wall plates on switch, receptacle, and blank outlets after painting is complete.
- G. Install receptacle for electric water cooler (EWC) within EWC cabinet as recommended by manufacturer.
- H. Install galvanized steel plates on outlet boxes and junction boxes in unfinished areas, above accessible ceilings, and on surface mounted outlets.

### 3.3 DUAL-LEVEL LIGHTING CONTROL

- A. Provide dual-level lighting control in spaces 100 square feet and larger.
- B. Coordinate manual controls with automatic controls so the manual control can reduce the lighting load by at least 50 percent in a reasonably uniform lighting pattern.
- C. Coordinate dual-level lighting controls with day lighting apertures, such as windows.
- D. Coordinate dual-level-lighting controls with luminaire ballasts specified in Section 26 51 00, Interior Lighting System.

### 3.4 GROUNDING

- A. Connect wiring device grounding terminal to branch circuit equipment grounding conductor.
- B. Connect isolated ground receptacle grounding terminal to the isolated grounding conductor.

### 3.5 IDENTIFICATION

- A. Identify wiring devices with circuit number as required in Section 26 05 53, Identification for Electrical Systems.

### 3.6 FIELD QUALITY CONTROL

- A. Inspect each wiring device for defects before installing.
- B. Operate each operable device at least six times with circuit energized; verify proper operation.

## WIRING DEVICES

- C. Test 15 and 20 ampere receptacles for proper polarity and ground continuity using an NRTL listed test device that impresses a momentary current of at least 15 amperes on the branch circuit conductors and equipment grounding path.
- D. Test ground-fault circuit interrupter receptacle operation with both local and remote fault simulations according to manufacturer recommendations.
  - 1. Verify that GFCI will trip at  $5 \pm 1$  mA current
  - 2. Verify that GFCI does not trip at less than 1.8 mA current.
- E. Replace damaged or defective wiring devices.

### 3.7 CLEANING AND ADJUSTING

- A. Clean devices and wall plates. Replace stained or improperly painted wall plates or devices.
- B. Adjust devices and wall plates to be flush and level.

END OF SECTION 26 27 26

## SECTION 26 28 16 - ENCLOSED SWITCHES AND CIRCUIT BREAKERS

### PART 1 GENERAL

#### 1.1 SECTION INCLUDES

- A. Safety switches
- B. Fuses
- C. Enclosed circuit breakers

#### 1.2 SUBMITTALS

- A. Submit the following in accordance with project submittal procedures:
  - 1. Product Data: Submit manufacturer's technical data for each type of safety switch and enclosed circuit breaker, including data proving that materials comply with specified requirements. Provide catalog sheets showing voltage and current ratings, short circuit ratings, dimensions, and enclosure details.
  - 2. Installation Instructions: Indicate application conditions and limitations of use. Include instructions for storage, handling, protection, examination, preparation, installation, and starting of Product.
  - 3. Certification: Submit certification and backup information that safety switches and enclosed circuit breakers can perform required functions after an earthquake as specified.
  - 4. Provide Project Resident Electrical Engineer with seven (7) copies of submittals.

#### 1.3 QUALITY ASSURANCE

- A. Comply with the adopted *National Electrical Code (NEC)* by the Authority Having Jurisdiction (AHJ) for components and installation.
- B. Provide safety switches and circuit breakers that are listed and labeled for the application, installation condition, and the environment in which installed.
- C. Comply with the following standards as applicable:
  - 1. NEMA AB 3 – *Molded Case Circuit Breakers and Their Application*
  - 2. NEMA FU 1 *Low Voltage Cartridge Fuses*
  - 3. NEMA KS 1 - *Enclosed and Miscellaneous Distribution Equipment Switches (600 Volts Maximum)*
  - 4. UL 50 - *Enclosures for Electrical Equipment.*
  - 5. UL 489 – *Molded Case Circuit Breakers, Molded Case Switches, and Circuit Breaker Enclosures*

## ENCLOSED SWITCHES AND CIRCUIT BREAKERS

#### 1.4 RECEIVING, STORING AND PROTECTING

- A. Receive, inspect, handle, and store safety switches and enclosed circuit breakers according to the manufacturer's written instructions and NECA 1 *Standard Practices for Good Workmanship in Electrical Construction* (ANSI).
- B. Perform receipt inspection of enclosed circuit breakers. Examine each circuit breaker to verify that it is genuine, new, and unaltered. Report any suspect/counterfeit circuit breakers to the project electrical engineer. Indicators of suspect/counterfeit molded-case circuit breakers include the following:
  - 1. Missing date code.
  - 2. Date code is older than two years, or style is no longer manufactured.
  - 3. Factory seals broken or removed.
  - 4. Mislabeled or over-labeled to change size or type.
  - 5. Non-English text in labels.
  - 6. Missing or suspect UL sticker; CE is not an acceptable.
  - 7. Low quality labeling and/or misspelled words on labels.
  - 8. Outdated manufacturer's label or logo, or refurbisher's name on label.
  - 9. Not received in original, sealed packaging.
  - 10. Screwdriver or wrench marks on terminals.
  - 11. Handle modified to change ampere rating.
  - 12. Contradicting amperage, voltage, or interrupting ratings.

#### 1.5 SERVICE CONDITIONS

- A. Provide safety switches and enclosed circuit breakers that will perform satisfactorily in the following service conditions:
  - 1. Elevation of 7500 feet above sea level.
  - 2. Maximum ambient temperature of 115 °F.
  - 3. 24-hour average temperature not exceeding 86 °F.
  - 4. Maximum solar heat gain: 110 W/sq/ft.

#### 1.6 EXTRA MATERIALS

- A. Provide one spray can of touch-up paint that matches finish of switches and enclosed circuit breakers finish.

#### ENCLOSED SWITCHES AND CIRCUIT BREAKERS

- B. Provide a spare set of three fuses of each type and size installed in fused safety switches.

## PART 2 PRODUCTS

### 2.1 PRODUCT OPTIONS AND SUBSTITUTIONS

- A. Alternate products may be accepted; by submittal for approval in writing to Project Resident Electrical Engineer.

### 2.2 SAFETY SWITCHES

- A. Provide NRTL-listed, NEMA KS 1 Type HD safety switches with ratings and number of poles as indicated on the Drawings or as required by the NEC.
- B. Safety switches used as service equipment shall be labeled for the application.
- C. Enclosure type shall be in accordance with NEMA KS 1 and as required by the conditions of installation and use.
- D. Fusible safety switches shall have rejection clips for NEMA FU 1, Class R fuses. Provide fuse pullers in 30, 60, 100 and 200 ampere fusible safety switches.
- E. Each safety switch shall have an equipment ground bar.
- F. Furnish an isolated neutral bar for each safety switch used on a circuit that includes a "neutral" conductor.
- G. Each safety switch shall have a factory-installed cover-mounted viewing window positioned over the blades to allow visual verification of ON-OFF status.
- H. Provide auxiliary electrical interlock switches with safety switches as indicated on the Drawings or as required by the application.
- I. Each safety switch shall have provisions for padlocking in the OFF position.
- J. Manufacturer: Square D "Class 3110" or approved equivalent.

### 2.3 FUSES

- A. Provide NRTL-listed, NEMA FU 1 Class R fuses for fusible safety switches as indicated on the Drawings, required by the NEC, or required by the manufacturer of served equipment.
- B. Size fuses in accordance with NEC requirements based upon load supplied.
- C. Manufacturer: Bussman "LPN-RK\_SP" (250 V), "LPS-RK\_SP" (600 V), and "SFC-FUSE-CAB" or approved equivalent.

### 2.4 ENCLOSED CIRCUIT BREAKERS

- A. Provide, enclosed molded-case circuit breakers with ratings as indicated on the Drawings or as required by the NEC.

#### ENCLOSED SWITCHES AND CIRCUIT BREAKERS

- B. Enclosed molded-case circuit breakers shall be listed to UL 489.
- C. Enclosed circuit breakers used as service equipment shall be labeled for the application.
- D. Enclosure type shall be in accordance with UL-50 and as required by the conditions of installation and use.
- E. Each enclosed circuit breaker shall have an equipment ground bar.
- F. Furnish a neutral bar for each enclosed circuit breaker used on a circuit that includes a grounded "neutral" conductor.
- G. Enclosed circuit breakers rated 100 amperes and larger shall be suitable for use with crimp-on compression lugs.
- H. Each enclosed circuit breaker shall have a permanently-installed provision for padlocking in the OFF position.
  - 1. Furnish handle lock-off device that will accept a 1/4-inch padlock shackle.
  - 2. Securely attach the device to the circuit breaker case; the attachment shall not depend on a friction fit or the presence of the enclosure front for the handle lock-off device to remain in place and be functional.
- I. Manufacturer: Square D "Class 610" enclosure with F, K, L, or M frame circuit breaker or approved equivalent.

### PART 3 EXECUTION

#### 3.1 EXISTING WORK

- A. Prep area where switches are to be located to accept switches.
- B. Maintain access to each existing safety switch and enclosed circuit breaker that is to remain active.

#### 3.2 EXAMINATION

- A. Examine surfaces to receive safety switches and enclosed circuit breakers for compliance with installation tolerances and other conditions affecting performance of the product. Do not proceed with installation until unsatisfactory conditions have been corrected.

#### 3.3 INSTALLATION

- A. Install safety switches and enclosed circuit breakers where indicated on the Drawings and according to manufacturer's instructions, NECA 1, and the *NEC*.
- B. Install each safety switch and enclosed circuit breaker so the interlock bypass will be accessible.
- C. Ground and bond safety switches and enclosed circuit breakers as required in Section 26 0526, Grounding and Bonding for Electrical Systems.

#### ENCLOSED SWITCHES AND CIRCUIT BREAKERS

- D. Install conduits as required in Section 26 05 33, Raceways and Boxes for Electrical Systems.
- E. Install conductors as required in Section 26 05 19, Low Voltage Electrical Power Conductors and Cables.
  - 1. Use compression type lugs to connect all service, feeder, and branch circuit cables to enclosed circuit breakers rated greater than 100 amperes.
  - 2. Tighten electrical connectors and terminals to the manufacturer's published torque-tightening values. Where manufacturer's torque values are not indicated, use those specified in UL 486A.
- F. Install fuses in fusible safety switches as indicated on the Drawings or as required to match installed motor or load characteristics. Apply adhesive tag on inside door of each fused switch indicating NEMA fuse class and size installed.

### 3.4 IDENTIFICATION

- A. Identify safety switches and enclosed circuit breakers and install warning signs and arc-flash warning labels as required in Section 26 05 53, Identification for Electrical Systems.
- B. Provide permanent indication of trip rating of each enclosed circuit breaker or fuses installed in each enclosed switch that will be visible without opening cover and exposing energized conductors.
- C. Mark floor in front of safety switches and enclosed circuit breakers to show NEC required working space according to Section 26 05 53, Identification for Electrical Systems.

### 3.5 FIELD QUALITY CONTROL

- A. Clean interior and exterior of safety switches and enclosed circuit breakers.
- B. Verify that ratings for safety switches and enclosed circuit breakers match values indicated on the Drawings.
- C. Verify proper torque of accessible bus connections and mechanical fasteners after installing safety switches and enclosed circuit breakers.
- D. Coordinate inspections and tests with those required by Section 26 08 13, Electrical Acceptance Testing.
- E. After completing installation, cleaning, and testing, touch up scratches and mars on finish to match original finish.

END OF SECTION 26 28 16

## ENCLOSED SWITCHES AND CIRCUIT BREAKERS

## SECTION 26 51 00 - INTERIOR LIGHTING

### PART 1 GENERAL

#### A. RELATED DOCUMENTS

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

#### B. SUMMARY

1. This Section includes interior lighting fixtures, lighting fixtures mounted on exterior building surfaces, lamps, ballasts, emergency lighting units, and accessories.
2. Related Sections include the following:
  - a. Division 26 Section "Exterior Lighting" for programmable lighting control systems, time switches, additional photoelectric relays, power relays, and contactors.

#### C. SUBMITTALS

1. Product Data: For each type of lighting fixture indicated, arranged in order of fixture designation. Include data on features, accessories, and the following:
  - a. Dimensions of fixtures.
  - b. Certified results of independent laboratory tests for fixtures and lamps for electrical ratings and photometric data.
  - c. Emergency lighting unit battery and charger.
  - d. Fluorescent and high-intensity-discharge ballasts.
  - e. Types of lamps.
2. Shop Drawings: Show details of nonstandard or custom fixtures. Indicate dimensions, weights, method of field assembly, components, features, and accessories.
3. Maintenance Data: For lighting fixtures to include in maintenance manuals specified in Division 1.

#### D. QUALITY ASSURANCE

Fixtures, Emergency Lighting Units, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to Authorities Having Jurisdiction.

Comply with NFPA 70.

NFPA 101 Compliance: Comply with visibility and luminance requirements for exit signs.

#### E. COORDINATION

Fixtures, Mounting Hardware, and Trim: Coordinate layout and installation of lighting fixtures with ceiling system and other construction elements.

#### F. WARRANTY

1. Special Warranty for Batteries: Written warranty, executed by manufacturer agreeing to replace rechargeable batteries that fail in materials or workmanship within specified warranty period.

## INTERIOR LIGHTING

2. Special Warranty Period for Batteries: Manufacturer's standard, but not less than 10 years from date of Substantial Completion. Full warranty shall apply for first year, and prorated warranty for last nine years.
3. Special Warranties for Fluorescent Ballasts: Written warranty, executed by manufacturer agreeing to replace fluorescent ballasts that fail in materials or workmanship within specified warranty period.
4. Special Warranty Period for Electronic Ballasts: Five years from date of manufacture, but not less than four years from date of Substantial Completion.
5. Special Warranty Period for Electromagnetic Ballasts: Manufacturers' standard warranty, but not less than two years from date of manufacture.

#### G. EXTRA MATERIALS

1. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  - a. Lamps: 10 for every 100 of each type and rating installed. Furnish at least one of each type.
  - b. Battery and Charger Data: For emergency lighting units.
  - c. Ballasts: 1 for every 100 of each type and rating installed. Furnish at least one of each type.

#### PART 2 – PRODUCTS

##### A. MANUFACTURERS

1. Products: Subject to compliance with requirements, provide one of the products indicated for each designation in the Lighting Fixture Schedule on the construction drawings.

##### B. FIXTURES AND FIXTURE COMPONENTS, GENERAL

1. Metal Parts: Free from burrs, sharp corners, and edges.
2. Sheet Metal Components: Steel, unless otherwise indicated. Form and support to prevent warping and sagging.
3. Doors, Frames, and Other Internal Access: Smooth operating, free from light leakage under operating conditions, and arranged to permit re-lamping without use of tools. Arrange doors, frames, lenses, diffusers, and other pieces to prevent accidental falling during re-lamping and when secured in operating position.
4. Reflecting Surfaces: Minimum reflectance as follows, unless otherwise indicated:
  - a. White Surfaces: 85 percent.
  - b. Specular Surfaces: 83 percent.
  - c. Diffusing Specular Surfaces: 75 percent.
  - d. Laminated Silver Metallized Film: 90 percent.
5. Lenses, Diffusers, Covers, and Globes: 100 percent virgin acrylic plastic or annealed crystal glass, unless otherwise indicated.
  - a. Plastic: High resistance to yellowing and other changes due to aging, exposure to heat, and ultraviolet radiation.
  - b. Lens Thickness: 0.125 inch minimum, unless greater thickness is indicated.

##### C. FLUORESCENT LAMP BALLASTS

#### INTERIOR LIGHTING

1. General Requirements: Unless otherwise indicated, features include the following:
  - a. Designed for type and quantity of lamps indicated at full light output.
  - b. Total Harmonic Distortion Rating: Less than 10 percent.
  - c. Sound Rating: A.
2. Electronic Ballasts for Linear Lamps: Unless otherwise indicated, features include the following, besides those in "General Requirements" Paragraph above:
  - a. Certified Ballast Manufacturer Certification: Indicated by label.
  - b. Encapsulation: Without voids in potting compound.
  - c. Parallel Lamp Circuits: Multiple lamp ballasts connected to maintain full light output on surviving lamps if one or more lamps fail.
3. Ballasts for Compact Lamps: Unless otherwise indicated, additional features include the following:
  - a. Type: Electronic or electromagnetic, fully encapsulated in potting compound.
  - b. Power Factor: 90 percent, minimum.
  - c. Operating Frequency: 20 kHz or higher.
  - d. Flicker: Less than 5 percent.
  - e. Lamp Current Crest Factor: Less than 1.7.
  - f. Transient Protection: Comply with IEEE C62.41 for Category A1 locations.

#### D. LAMPS

1. Fluorescent Color Temperature and Minimum Color-Rendering Index: 3500 K and 85 CRI, unless otherwise indicated.
2. Non-compact Fluorescent Lamp Life: Rated average is 20,000 hours at 3 hours per start when used on rapid-start circuits.
3. Metal-Halide Color Temperature and Minimum Color-Rendering Index: 3600 K and 70 CRI, unless otherwise indicated.

#### E. FIXTURE SUPPORT COMPONENTS

1. Comply with Division 26, REQUIREMENTS FOR ELECTRICAL INSTALLATIONS, for channel- and angle-iron supports and nonmetallic channel and angle supports.
2. Single-Stem Hangers: 1/2-inch steel tubing with swivel ball fitting and ceiling canopy. Finish same as fixture.
3. Twin-Stem Hangers: Two, 1/2-inch steel tubes with single canopy arranged to mount a single fixture. Finish same as fixture.
4. Rod Hangers: 3/16-inch- minimum diameter, cadmium-plated, threaded steel rod.
5. Hook Hangers: Integrated assembly matched to fixture and line voltage and equipped with threaded attachment, cord, and locking-type plug.

#### F. FINISHES

1. Fixtures: Manufacturer's standard, unless otherwise indicated.
2. Paint Finish: Applied over corrosion-resistant treatment or primer, free of defects.
  - a. Metallic Finish: Corrosion resistant.

#### INTERIOR LIGHTING

## PART 3 - EXECUTION

### A. INSTALLATION

1. 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.
2. Support for Fixtures in or on Grid-Type Suspended Ceilings: DO NOT use grid for support.
3. Install a minimum of four ceiling support system rods or wires for each fixture. Locate not more than 6 inches from fixture corners.
4. Support Clips: Fasten to fixtures and to ceiling grid members at or near each fixture corner.
5. 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 metal channels spanning and secured to ceiling tees.

### B. CONNECTIONS

1. Ground Equipment.
  - a. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

### C. FIELD QUALITY CONTROL

1. Inspect each installed fixture for damage. Replace damaged fixtures and components.
2. Advance Notice: Give dates and times for field tests.
3. Provide instruments to make and record test results.
4. Tests: As follows:
  - a. Verify normal operation of each fixture after installation.
  - b. Emergency Lighting: Interrupt electrical supply to demonstrate proper operation.
  - c. Verify normal transfer to battery source and retransfer to normal.
  - d. Submit results in writing to Project Resident Electrical Engineer.
5. Malfunctioning Fixtures and Components: Replace or repair, then retest. Repeat procedure until units operate properly.

### D. CLEANING AND ADJUSTING

1. Clean fixtures internally and externally after installation. Use methods and materials recommended by manufacturer.
2. Adjust fixtures to provide required light intensities.

END OF SECTION 26 51 00

## INTERIOR LIGHTING