

# Project Manual



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## Science and Band Building

at

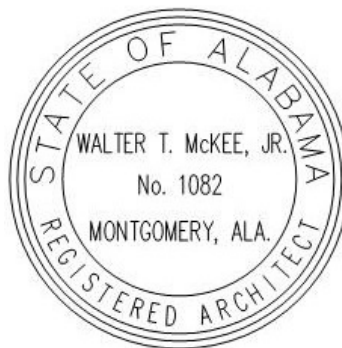
## Vina High School

for the

## Franklin County Board of Education

### Russellville, Alabama

**Project No: 18-144**  
**October 2, 2018**



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A SCIENCE AND BAND BUILDING  
AT  
VINA HIGH SCHOOL  
FOR  
THE FRANKLIN COUNTY BOARD OF EDUCATION  
RUSSELLVILLE, ALABAMA

PROJECT NO. 18-144

## BIDDING REQUIREMENTS

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Request For Information (McKee Form)

Prior Approval/Substitution Request Form (McKee Form)

Internet/Data Instructions To Access McKee Projects (McKee Form)

Proposal Form (ABC Form C-3, August 2001)

Accounting Of Sales Tax, Attachment To ABC Form C-3 (ABC Form C-3A, October 2013)

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Statement Of Compliance

Form of Bid Bond (ABC Form C-4, August 2001)

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Construction Contract (ABC Form C-5, August 2001)

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State Of Alabama Department Of Revenue "Notice" regarding Tax Guidance for  
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contracts and Form ST:EXC-01.

Disclosure Statement of Relationships Between Contractor/Grantees and Public  
Officials/Employees Pursuant to Executive Order #55

Act 2012-491 Amending The Alabama Immigration Law (ABC Bulletin, May 29, 2012)

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## ADVERTISEMENT FOR BIDS

A SCIENCE AND BAND BUILDING  
AT  
VINA HIGH SCHOOL  
FOR  
THE FRANKLIN COUNTY BOARD OF EDUCATION  
RUSSELLVILLE, ALABAMA

PROJECT NO. 18-144

Sealed proposal will be received for the above referenced project by Mr. Greg Hamilton, Superintendent, at The Franklin County Board Of Education, Russellville, Alabama, until **Thursday, November 1, 2018 @ 2:00 PM**, then opened and read aloud.

The project shall be bid excluding taxes. Bid must be submitted on proposal forms furnished by the Architect or copies thereof. No bid may be withdrawn after scheduled closing for receipt of bids for a period of sixty (60) days. The Owner reserves the right to reject any or all proposals and to waive technical errors if, in the Owners judgment, the best interests of the Owner will thereby be promoted.

A certified check or Bid Bond payable to The Franklin County Board Of Education in an amount not less than five percent (5%) of the amount of the bid, but in no event more than \$10,000.00 must accompany the bidder's proposal. Performance and statutory labor and material payment bonds will be required at the signing of the Contract.

All bidders bidding in amounts exceeding that established by the State Licensing Board for General Contractors must be licensed under the provisions of Title 34, Chapter 8, Code of Alabama, 1975, and must show evidence of license before bidding or bid will not be received or considered by the Architect. All bidders shall show such evidence by clearly displaying current license number on the outside of the sealed envelope in which the proposal is delivered.

Electronic images of the documents may be viewed on-line and printed by General Contractors, Sub-Contractors and Suppliers by obtaining documents through the **www.mckeeassoc.com** web site, by contacting the Architect at **mckeeplans@gmail.com** for log-in information and password. Please provide company name, address, phone #, fax #, email address and GC License #. This is the only web site endorsed by the Architect. The Architect is unable to monitor, confirm and maintain websites that are beyond his control. Addendums shall be posted on the above web site. The Architect retains ownership and copyrights of the documents. If bidders require printed sets the following shall apply: Submit to the Architect a deposit of **\$50.00** per set. The deposit shall be refunded for each set returned in reusable condition within ten days after bid opening.

All RFI's and RFA's regarding the bid documents shall be sent and addressed thru the following e-mail account: [chamliesc@mckeeassoc.com](mailto:chamliesc@mckeeassoc.com). The Architect will not accept inquiries via telephone or fax.

Completion Time: work to be completed by **August 1, 2019**.

Supervision: Contractor to provide Superintendent(s) to ensure proper supervision for all work.

Owner:

Mr. Greg Hamilton, Superintendent  
The Franklin County Board of Education  
500 Coffee Avenue NE  
Russellville, AL 35653  
Phone: 256-332-1360

Architect:

McKee and Associates  
Architecture and Interior Design  
631 South Hull Street  
Montgomery, Alabama 36104  
Phone: (334) 834-9933

# REQUEST FOR INFORMATION FORM

EMAIL THIS FORM TO THE FOLLOWING

Project Manager: [chamliesc@mckeeassoc.com](mailto:chamliesc@mckeeassoc.com)

The Architect reserves the right not to answer any requests for information received after 2:00 PM, 2 days prior to the bid date.

**Bid Phase**

**Construction Phase**

Architect RFI # \_\_\_\_\_ Date: \_\_\_\_\_

Job Number: \_\_\_\_\_ BC Job Number: \_\_\_\_\_

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

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

Company: \_\_\_\_\_

Phone Number: \_\_\_\_\_ Fax Number: \_\_\_\_\_

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

## Procedures for “Questions and/or Clarifications”

Should any bidder observe any ambiguity, discrepancy, omission, or error in the drawings and specifications, or in any other bid document, or be in doubt as to the intention and meaning of these documents, the bidder should immediately report such to the Architect and request clarification.

**Clarification will be made only by written Addenda sent to all prospective bidders or can be accessed by going to the McKee web site - [mckeeassoc.com](http://mckeeassoc.com) and clicking on the tab “Files” to retrieve the Addendums.** Neither the Architect nor the Owner will be responsible in any manner for verbal answers or instructions regarding intent or meaning of the Bid Documents.

**In the case of inconsistency between drawings and specifications or within either document, a bidder will be deemed to have included in its bid the better quality or greater quantity of the work involved unless the bidder asked for and obtained the Architect’s written clarification of the requirements before submission of a bid.**



[illegible][illegible]

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# PRIOR APPROVAL / SUBSTITUTION REQUEST FORM

EMAIL THIS FORM TO THE FOLLOWING - Project Manager: [chamliesc@mckeeassoc.com](mailto:chamliesc@mckeeassoc.com)

**ALL products, materials, systems, pieces of equipment, & services requesting prior approval shall be submitted to the architect for approval no later than 2:00 PM, 5 days prior to the bid date.**

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

**COMPANY SUBMITTING REQUEST:** \_\_\_\_\_

\_\_\_\_\_  
(Name and Address)  
**CONTACT NAME:** \_\_\_\_\_ **PHONE:** \_\_\_\_\_

**FAX:** \_\_\_\_\_ **EMAIL:** \_\_\_\_\_

**PROJECT NAME:** \_\_\_\_\_

**SPECIFIED PRODUCT:** \_\_\_\_\_  
(Section) (Page) (Description)

## Procedures for “Substitutions” and “Pre-bid Approval”.

a) The identification of any product, material, system, item of equipment, or service in the Bid Documents by reference to a trade name, manufacturer’s name, model number, etc. (hereinafter referred to as “source”), is intended to establish a required standard of performance, design, and quality and is not intended to limit competition unless the provisions of paragraph “d” below apply.

b) When the Bid Documents identify only one or two sources, or three or more sources followed by “or approved equal” or similar wording, the bidder’s proposal may be based on a source not identified but considered by the bidder to be equal to the standard of performance, design and quality as specified; however, such substitutions must ultimately be approved by the Architect. If the bidder elects to bid on a substitution without “Pre-bid Approval” as described below, then it will be understood that proof of compliance with specified requirements is the exclusive responsibility of the bidder.

c) When the Bid Documents identify three or more sources and the list of sources is not followed by “or approved equal” or similar wording, the bidder’s proposal shall be based upon one of the identified sources, unless the bidder obtains “Pre-bid Approval” of another source as described below. Under these conditions it will be expressly understood that no product, material, system, item of equipment, or service that is not identified in the Bid Documents or granted “Pre-Bid Approval” will be incorporated into the Work unless such substitution is authorized and agreed upon through a Contract Change Order.

d) If the Bid Documents identify only one source and expressly provide that it is an approved sole source for the product, material, system, item of equipment, or service, the bidder’s proposal must be based upon the identified sole source.

e) **Procedures for “Pre-bid Approval”.** If it is desired that a product, material, system, piece of equipment, or service from a source different from those sources identified in the Bid Documents be approved as an acceptable source, application for the approval of such source must reach the hands of the Architect at least ten days prior to the date set for the opening of bids. At the Architect’s discretion, this

ten day provision may be waived. **The application for approval of a proposed source must be accompanied by technical data which the applicant desires to submit in support of the application.**

The Architect will give consideration to reports from reputable independent testing laboratories, verified experience records showing the reputation of the proposed source with previous users, evidence of reputation of the source for prompt delivery, evidence of reputation of the source for efficiency in servicing its products, or any other pertinent written information. **The application to the Architect for approval of a proposed source must be accompanied by a schedule setting forth in which respects the materials or equipment submitted for consideration differ from the materials or equipment designated in the Bid Documents. The burden of proof of the merit of the proposed substitution is upon the proposer. To be approved, a proposed source must also meet or exceed all express requirements of the Bid Documents.** Approval, if granted, shall not be effective until published by the Architect in an addendum to the Bid Documents.

The undersigned requests consideration of the following product substitution:

**PROPOSED SUBSTITUTION:** \_\_\_\_\_  
(Provide Product Name / Model / Manufacture)

1. \_\_\_\_\_ Yes / No the materials or equipment submitted for consideration differ from the materials or equipment designated in the Bid Documents. If Yes, submit marked-up data reflecting the differences as described above.
2. Attached Data Includes: \_\_\_\_\_ Product Description \_\_\_\_\_ Performance and Test Data  
\_\_\_\_\_ Drawings \_\_\_\_\_ Specifications  
\_\_\_\_\_ Photographs
3. \_\_\_\_\_ Yes / No changes will be required to the Contract Documents for the proper installation of the proposed product substitution. If Yes, attach data that indicates description of changes.

The undersigned states that the following paragraphs, unless modified by attachments, are correct:

1. \_\_\_\_\_ The proposed substitution does not affect dimensions shown on the drawings.
2. \_\_\_\_\_ No changes to the building design, engineering design, or detailing are required by the substitution.
3. \_\_\_\_\_ The proposed substitution will have no adverse affect on other trades, the construction schedule, or specified warranty requirements.
4. \_\_\_\_\_ No maintenance is required by the proposed substitution other than that required for originally specified product.
5. \_\_\_\_\_ Other information.

**The undersigned further states that they have read the corresponding specification sections in the project manual and confirms that the function, appearance and quality of the proposed substitution are equivalent or superior to the originally specified product: \_\_\_\_\_ initial.**

**SIGNATURE:** \_\_\_\_\_ **PRINTED NAME:** \_\_\_\_\_

## **INTERNET / DATA INSTRUCTIONS TO ACCESS McKEE PROJECTS**

McKEE AND ASSOCIATES HAS **ALL OF THEIR PROJECTS** WHICH ARE OUT TO BID LISTED ON THE INTERNET AT THE FOLOWING ADDRESS:

[www.projectinformation.net](http://www.projectinformation.net)

PLEASE USE THIS SITE TO RECEIVE BID LISTS, PHONE & FAX NUMBERS OF ALL PLAN HOLDERS.

**HOME PAGE:** ON LEFT HAND SIDE OF PAGE IT WILL SAY:

**WELCOME 1<sup>ST</sup> TIME USERS  
CLICK HERE**

**CLICK THERE AND FOLLOW THE INSTRUCTIONS BELOW:**

- 1. LOG ON – SPECIFY USER ID & PASSWORD (USE LOWER CASE NO SPACES)**
- 2. GIVE COMPANY NAME, ADDRESS, PHONE NUMBER & EMAIL ADDRESS**
- 3. REGISTER AS AN INFORMATION COMPANY**

**DO NOT ANSWER THE QUESTIONS REGARDING PROJECT ORIGINATOR.**

- 4. SUBMIT**

THIS LIST WILL GIVE YOU A SCOPE OF WORK, ALL PLAN HOLDERS, PHONE AND FAX NUMBERS.

THANKS!

KATHY SHEFFIELD

# PROPOSAL FORM

ABC Form C-3  
August 2001

To: \_\_\_\_\_ Date: \_\_\_\_\_  
(Awarding Authority)

In compliance with your Advertisement for Bids and subject to all the conditions thereof, the undersigned

\_\_\_\_\_  
(Legal Name of Bidder)

hereby proposes to furnish all labor and materials and perform all work required for the construction of  
**WORK** \_\_\_\_\_

in accordance with Drawings and Specifications, dated \_\_\_\_\_, prepared by  
\_\_\_\_\_, Architect/Engineer.

The Bidder, which is organized and existing under the laws of the State of \_\_\_\_\_,  
having its principal offices in the City of \_\_\_\_\_,  
is: ☐ a Corporation ☐ a Partnership ☐ an individual ☐ (other) \_\_\_\_\_.

**LISTING OF PARTNERS OR OFFICERS:** If Bidder is a Partnership, list all partners and their addresses; if Bidder is a Corporation, list the names, titles, and business addresses of its officers:

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

**BIDDER'S REPRESENTATION:** The Bidder declares that it has examined the site of the Work, having become fully informed regarding all pertinent conditions, and that it has examined the Drawings and Specifications (including all Addenda received) for the Work and the other Bid and Contract Documents relative thereto, and that it has satisfied itself relative to the Work to be performed.

**ADDENDA:** The Bidder acknowledges receipt of Addenda Nos. \_\_\_\_\_ through \_\_\_\_\_ inclusively.

**BASE BID:** For construction complete as shown and specified, the sum of \_\_\_\_\_  
\_\_\_\_\_ Dollars (\$ \_\_\_\_\_)

**ALTERNATES:** If alternates as set forth in the Bid Documents are accepted, the following adjustments are to be made to the Base Bid:

For Alternate No. 1 ( ..... ) (add)(deduct) \$ \_\_\_\_\_  
(Insert key word for Alternate)

For Alternate No. 2 ( ..... ) (add)(deduct) \$ \_\_\_\_\_

For Alternate No. 3 ( ..... ) (add)(deduct) \$ \_\_\_\_\_

For Alternate No. 4 ( ..... ) (add)(deduct) \$ \_\_\_\_\_

For Alternate No. 5 ( ..... ) (add)(deduct) \$ \_\_\_\_\_

For Alternate No. 6 ( ..... ) (add)(deduct) \$ \_\_\_\_\_

**UNIT PRICES-** (See Attachment)

**BID SECURITY:** The undersigned agrees to enter into a Construction Contract and furnish the prescribed Performance and Payment Bonds and evidence of insurance within fifteen calendar days, or such other period stated in the Bid Documents, after the contract forms have been presented for signature, provided such presentation is made within 30 calendar days after the opening of bids, or such other period stated in the Bid Documents. As security for this condition, the undersigned further agrees that the funds represented by the Bid Bond (or cashier's check) attached hereto may be called and paid into the account of the Awarding Authority as liquidated damages for failure to so comply.

Attached hereto is a: *(Mark the appropriate box and provide the applicable information.)*

☐ Bid Bond, executed by \_\_\_\_\_ as Surety,  
☐ a cashier's check on the \_\_\_\_\_ Bank of \_\_\_\_\_,  
for the sum of \_\_\_\_\_ Dollars  
(\$ \_\_\_\_\_) made payable to the Awarding Authority.

**BIDDER'S ALABAMA LICENSE:**

State License for General Contracting: \_\_\_\_\_  
License Number Bid Limit Type(s) of Work

**CERTIFICATIONS:** The undersigned certifies that he or she is authorized to execute contracts on behalf of the Bidder as legally named, that this proposal is submitted in good faith without fraud or collusion with any other bidder, that the information indicated in this document is true and complete, and that the bid is made in full accord with State law. Notice of acceptance may be sent to the undersigned at the address set forth below.

The Bidder also declares that a list of all proposed major subcontractors and suppliers will be submitted at a time subsequent to the receipt of bids as established by the Architect in the Bid Documents but in no event shall this time exceed twenty-four (24) hours after receipt of bids.

**Legal Name of Bidder** \_\_\_\_\_

**Mailing Address** \_\_\_\_\_

**\* By (Legal Signature)** \_\_\_\_\_

**\* Name (type or print)** \_\_\_\_\_ (Seal)

**\* Title** \_\_\_\_\_

**Telephone Number** \_\_\_\_\_

\* If other than the individual proprietor, or an above named member of the Partnership, or the above named president, vice-president, or secretary of the Corporation, attach written authority to bind the Bidder. Any modification to a bid shall be over the initials of the person signing the bid, or of an authorized representative.

**ACCOUNTING OF SALES TAX**  
**Attachment to ABC Form C-3**  
**Proposal Form**

To: \_\_\_\_\_ Date: \_\_\_\_\_  
(Awarding Authority)

NAME OF PROJECT \_\_\_\_\_  
\_\_\_\_\_

**SALES TAX ACCOUNTING**

Pursuant to Act 2013-205, Section 1(g) the Contractor accounts for the sales tax NOT included in the bid proposal form as follows:

**ESTIMATED SALES TAX AMOUNT**

<b>BASE BID:</b>	\$ _____
Alternate No. 1 ( ..... ) (Insert key word for Alternate)	(add)(deduct) \$ _____
Alternate No. 2 ( ..... )	(add)(deduct) \$ _____
Alternate No. 3 ( ..... )	(add)(deduct) \$ _____
Alternate No. 4 ( ..... )	(add)(deduct) \$ _____
Alternate No. 5 ( ..... )	(add)(deduct) \$ _____
Alternate No. 6 ( ..... )	(add)(deduct) \$ _____

**Failure to provide an accounting of sales tax shall render the bid non-responsive. Other than determining responsiveness, sales tax accounting shall not affect the bid pricing nor be considered in the determination of the lowest responsible and responsive bidder.**

Legal Name of Bidder \_\_\_\_\_

Mailing Address \_\_\_\_\_

\* By (Legal Signature) \_\_\_\_\_

\* Name (type or print) \_\_\_\_\_

(Seal)

\* Title \_\_\_\_\_

Telephone Number \_\_\_\_\_

Company ID Number: \_\_\_\_\_

## **THE E-VERIFY PROGRAM FOR EMPLOYMENT VERIFICATION MEMORANDUM OF UNDERSTANDING**

### **ARTICLE I**

#### **PURPOSE AND AUTHORITY**

This Memorandum of Understanding (MOU) sets forth the points of agreement between the Department of Homeland Security (DHS) and \_\_\_\_\_ (Employer) regarding the Employer's participation in the Employment Eligibility Verification Program (E-Verify). This MOU explains certain features of the E-Verify program and enumerates specific responsibilities of DHS, the Social Security Administration (SSA), and the Employer. E-Verify is a program that electronically confirms an employee's eligibility to work in the United States after completion of the Employment Eligibility Verification Form (Form I-9). For covered government contractors, E-Verify is used to verify the employment eligibility of all newly hired employees and all existing employees assigned to Federal contracts or to verify the entire workforce if the contractor so chooses.

Authority for the E-Verify program is found in Title IV, Subtitle A, of the Illegal Immigration Reform and Immigrant Responsibility Act of 1996 (IIRIRA), Pub. L. 104-208, 110 Stat. 3009, as amended (8 U.S.C. § 1324a note). Authority for use of the E-Verify program by Federal contractors and subcontractors covered by the terms of Subpart 22.18, "Employment Eligibility Verification", of the Federal Acquisition Regulation (FAR) (hereinafter referred to in this MOU as a "Federal contractor with the FAR E-Verify clause") to verify the employment eligibility of certain employees working on Federal contracts is also found in Subpart 22.18 and in Executive Order 12989, as amended.

### **ARTICLE II**

#### **FUNCTIONS TO BE PERFORMED**

##### **A. RESPONSIBILITIES OF SSA**

1. SSA agrees to provide the Employer with available information that allows the Employer to confirm the accuracy of Social Security Numbers provided by all employees verified under this MOU and the employment authorization of U.S. citizens.
2. SSA agrees to provide to the Employer appropriate assistance with operational problems that may arise during the Employer's participation in the E-Verify program. SSA agrees to provide the Employer with names, titles, addresses, and telephone numbers of SSA representatives to be contacted during the E-Verify process.
3. SSA agrees to safeguard the information provided by the Employer through the E-Verify program procedures, and to limit access to such information, as is appropriate by law, to individuals responsible for the verification of Social Security Numbers and for evaluation of the E-Verify program or such other persons or entities who may be authorized by SSA as governed by the Privacy Act (5 U.S.C. § 552a), the Social Security Act (42 U.S.C. 1306(a)), and SSA regulations (20 CFR Part 401).



Company ID Number: \_\_\_\_\_

4. SSA agrees to provide a means of automated verification that is designed (in conjunction with DHS's automated system if necessary) to provide confirmation or tentative nonconfirmation of U.S. citizens' employment eligibility within 3 Federal Government work days of the initial inquiry.

5. SSA agrees to provide a means of secondary verification (including updating SSA records as may be necessary) for employees who contest SSA tentative nonconfirmations that is designed to provide final confirmation or nonconfirmation of U.S. citizens' employment eligibility and accuracy of SSA records for both citizens and non-citizens within 10 Federal Government work days of the date of referral to SSA, unless SSA determines that more than 10 days may be necessary. In such cases, SSA will provide additional verification instructions.

## **B. RESPONSIBILITIES OF DHS**

1. After SSA verifies the accuracy of SSA records for employees through E-Verify, DHS agrees to provide the Employer access to selected data from DHS's database to enable the Employer to conduct, to the extent authorized by this MOU:

- Automated verification checks on employees by electronic means, and
- Photo verification checks (when available) on employees.

2. DHS agrees to provide to the Employer appropriate assistance with operational problems that may arise during the Employer's participation in the E-Verify program. DHS agrees to provide the Employer names, titles, addresses, and telephone numbers of DHS representatives to be contacted during the E-Verify process.

3. DHS agrees to make available to the Employer at the E-Verify Web site and on the E-Verify Web browser, instructional materials on E-Verify policies, procedures and requirements for both SSA and DHS, including restrictions on the use of E-Verify. DHS agrees to provide training materials on E-Verify.

4. DHS agrees to provide to the Employer a notice, which indicates the Employer's participation in the E-Verify program. DHS also agrees to provide to the Employer anti-discrimination notices issued by the Office of Special Counsel for Immigration-Related Unfair Employment Practices (OSC), Civil Rights Division, U.S. Department of Justice.

5. DHS agrees to issue the Employer a user identification number and password that permits the Employer to verify information provided by employees with DHS's database.

6. DHS agrees to safeguard the information provided to DHS by the Employer, and to limit access to such information to individuals responsible for the verification of employees' employment eligibility and for evaluation of the E-Verify program, or to such other persons or entities as may be authorized by applicable law. Information will be used only to verify the accuracy of Social Security Numbers and employment eligibility, to enforce the Immigration and Nationality Act (INA) and Federal criminal laws, and to administer Federal contracting requirements.

**Company ID Number:** \_\_\_\_\_

7. DHS agrees to provide a means of automated verification that is designed (in conjunction with SSA verification procedures) to provide confirmation or tentative nonconfirmation of employees' employment eligibility within 3 Federal Government work days of the initial inquiry.

8. DHS agrees to provide a means of secondary verification (including updating DHS records as may be necessary) for employees who contest DHS tentative nonconfirmations and photo non-match tentative nonconfirmations that is designed to provide final confirmation or nonconfirmation of the employees' employment eligibility within 10 Federal Government work days of the date of referral to DHS, unless DHS determines that more than 10 days may be necessary. In such cases, DHS will provide additional verification instructions.

### **C. RESPONSIBILITIES OF THE EMPLOYER**

1. The Employer agrees to display the notices supplied by DHS in a prominent place that is clearly visible to prospective employees and all employees who are to be verified through the system.

2. The Employer agrees to provide to the SSA and DHS the names, titles, addresses, and telephone numbers of the Employer representatives to be contacted regarding E-Verify.

3. The Employer agrees to become familiar with and comply with the most recent version of the E-Verify User Manual.

4. The Employer agrees that any Employer Representative who will perform employment verification queries will complete the E-Verify Tutorial before that individual initiates any queries.

A. The Employer agrees that all Employer representatives will take the refresher tutorials initiated by the E-Verify program as a condition of continued use of E-Verify.

B. Failure to complete a refresher tutorial will prevent the Employer from continued use of the program.

5. The Employer agrees to comply with current Form I-9 procedures, with two exceptions:

- If an employee presents a "List B" identity document, the Employer agrees to only accept "List B" documents that contain a photo. (List B documents identified in 8 C.F.R. § 274a.2(b)(1)(B)) can be presented during the Form I-9 process to establish identity.) If an employee objects to the photo requirement for religious reasons, the Employer should contact E-Verify at 888-464-4218.

- If an employee presents a DHS Form I-551 (Permanent Resident Card) or Form I-766 (Employment Authorization Document) to complete the Form I-9, the Employer agrees to make a photocopy of the document and to retain the photocopy with the employee's Form I-9. The photocopy must be of sufficient quality to allow for verification of the photo and written information. The employer will use the photocopy to verify the photo and to assist DHS with its review of

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photo non-matches that are contested by employees. Note that employees retain the right to present any List A, or List B and List C, documentation to complete the Form I-9. DHS may in the future designate other documents that activate the photo screening tool.

6. The Employer understands that participation in E-Verify does not exempt the Employer from the responsibility to complete, retain, and make available for inspection Forms I-9 that relate to its employees, or from other requirements of applicable regulations or laws, including the obligation to comply with the antidiscrimination requirements of section 274B of the INA with respect to Form I-9 procedures, except for the following modified requirements applicable by reason of the Employer's participation in E-Verify: (1) identity documents must have photos, as described in paragraph 5 above; (2) a rebuttable presumption is established that the Employer has not violated section 274A(a)(1)(A) of the Immigration and Nationality Act (INA) with respect to the hiring of any individual if it obtains confirmation of the identity and employment eligibility of the individual in good faith compliance with the terms and conditions of E-Verify; (3) the Employer must notify DHS if it continues to employ any employee after receiving a final nonconfirmation, and is subject to a civil money penalty between \$550 and \$1,100 for each failure to notify DHS of continued employment following a final nonconfirmation; (4) the Employer is subject to a rebuttable presumption that it has knowingly employed an unauthorized alien in violation of section 274A(a)(1)(A) if the Employer continues to employ an employee after receiving a final nonconfirmation; and (5) no person or entity participating in E-Verify is civilly or criminally liable under any law for any action taken in good faith based on information provided through the confirmation system. DHS reserves the right to conduct Form I-9 and E-Verify system compliance inspections during the course of E-Verify, as well as to conduct any other enforcement activity authorized by law.

7. The Employer agrees to initiate E-Verify verification procedures for new employees within 3 Employer business days after each employee has been hired (but after the Form I-9 has been completed), and to complete as many (but only as many) steps of the E-Verify process as are necessary according to the E-Verify User Manual, or in the case of Federal contractors with the FAR E-Verify clause, the E-Verify User Manual for Federal Contractors. The Employer is prohibited from initiating verification procedures before the employee has been hired and the Form I-9 completed. If the automated system to be queried is temporarily unavailable, the 3-day time period is extended until it is again operational in order to accommodate the Employer's attempting, in good faith, to make inquiries during the period of unavailability. Employers may initiate verification by notating the Form I-9 in circumstances where the employee has applied for a Social Security Number (SSN) from the SSA and is waiting to receive the SSN, provided that the Employer performs an E-Verify employment verification query using the employee's SSN as soon as the SSN becomes available.

8. The Employer agrees not to use E-Verify procedures for pre-employment screening of job applicants, in support of any unlawful employment practice, or for any other use not authorized by this MOU. Employers must use E-Verify for all new employees, unless an Employer is a Federal contractor that qualifies for the exceptions described in Article II.D.1.c. Except as provided in Article II.D, the Employer will not verify selectively and will not verify employees hired before the effective date of this MOU. The Employer understands that if the Employer uses the E-Verify system for any purpose other than as

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authorized by this MOU, the Employer may be subject to appropriate legal action and termination of its access to SSA and DHS information pursuant to this MOU.

9. The Employer agrees to follow appropriate procedures (see Article III. below) regarding tentative nonconfirmations, including notifying employees in private of the finding and providing them written notice of the findings, providing written referral instructions to employees, allowing employees to contest the finding, and not taking adverse action against employees if they choose to contest the finding. Further, when employees contest a tentative nonconfirmation based upon a photo non-match, the Employer is required to take affirmative steps (see Article III.B. below) to contact DHS with information necessary to resolve the challenge.

10. The Employer agrees not to take any adverse action against an employee based upon the employee's perceived employment eligibility status while SSA or DHS is processing the verification request unless the Employer obtains knowledge (as defined in 8 C.F.R. § 274a.1(l)) that the employee is not work authorized. The Employer understands that an initial inability of the SSA or DHS automated verification system to verify work authorization, a tentative nonconfirmation, a case in continuance (indicating the need for additional time for the government to resolve a case), or the finding of a photo non-match, does not establish, and should not be interpreted as evidence, that the employee is not work authorized. In any of the cases listed above, the employee must be provided a full and fair opportunity to contest the finding, and if he or she does so, the employee may not be terminated or suffer any adverse employment consequences based upon the employee's perceived employment eligibility status (including denying, reducing, or extending work hours, delaying or preventing training, requiring an employee to work in poorer conditions, refusing to assign the employee to a Federal contract or other assignment, or otherwise subjecting an employee to any assumption that he or she is unauthorized to work) until and unless secondary verification by SSA or DHS has been completed and a final nonconfirmation has been issued. If the employee does not choose to contest a tentative nonconfirmation or a photo non-match or if a secondary verification is completed and a final nonconfirmation is issued, then the Employer can find the employee is not work authorized and terminate the employee's employment. Employers or employees with questions about a final nonconfirmation may call E-Verify at 1-888-464-4218 or OSC at 1-800-255-8155 or 1-800-237-2515 (TDD).

11. The Employer agrees to comply with Title VII of the Civil Rights Act of 1964 and section 274B of the INA, as applicable, by not discriminating unlawfully against any individual in hiring, firing, or recruitment or referral practices because of his or her national origin or, in the case of a protected individual as defined in section 274B(a)(3) of the INA, because of his or her citizenship status. The Employer understands that such illegal practices can include selective verification or use of E-Verify except as provided in part D below, or discharging or refusing to hire employees because they appear or sound "foreign" or have received tentative nonconfirmations. The Employer further understands that any violation of the unfair immigration-related employment practices provisions in section 274B of the INA could subject the Employer to civil penalties, back pay awards, and other sanctions, and violations of Title VII could subject the Employer to back pay awards, compensatory and punitive damages. Violations of either section 274B of the INA or Title VII may also lead to the termination of its participation in E-Verify. If the Employer has any questions relating to the anti-discrimination provision, it should contact OSC at 1-800-255-8155 or 1-800-237-2515 (TDD).

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12. The Employer agrees to record the case verification number on the employee's Form I-9 or to print the screen containing the case verification number and attach it to the employee's Form I-9.

13. The Employer agrees that it will use the information it receives from SSA or DHS pursuant to E-Verify and this MOU only to confirm the employment eligibility of employees as authorized by this MOU. The Employer agrees that it will safeguard this information, and means of access to it (such as PINS and passwords) to ensure that it is not used for any other purpose and as necessary to protect its confidentiality, including ensuring that it is not disseminated to any person other than employees of the Employer who are authorized to perform the Employer's responsibilities under this MOU, except for such dissemination as may be authorized in advance by SSA or DHS for legitimate purposes.

14. The Employer acknowledges that the information which it receives from SSA is governed by the Privacy Act (5 U.S.C. § 552a(i)(1) and (3)) and the Social Security Act (42 U.S.C. 1306(a)), and that any person who obtains this information under false pretenses or uses it for any purpose other than as provided for in this MOU may be subject to criminal penalties.

15. The Employer agrees to cooperate with DHS and SSA in their compliance monitoring and evaluation of E-Verify, including by permitting DHS and SSA, upon reasonable notice, to review Forms I-9 and other employment records and to interview it and its employees regarding the Employer's use of E-Verify, and to respond in a timely and accurate manner to DHS requests for information relating to their participation in E-Verify.

#### **D. RESPONSIBILITIES OF FEDERAL CONTRACTORS WITH THE FAR E-VERIFY CLAUSE**

1. The Employer understands that if it is a subject to the employment verification terms in Subpart 22.18 of the FAR, it must verify the employment eligibility of any existing employee assigned to the contract and all new hires, as discussed in the Supplemental Guide for Federal Contractors. Once an employee has been verified through E-Verify by the Employer, the Employer may not reverify the employee through E-Verify.

a. Federal contractors with the FAR E-Verify clause agree to become familiar with and comply with the most recent versions of the E-Verify User Manual for Federal Contractors and the E-Verify Supplemental Guide for Federal Contractors.

b. Federal contractors with the FAR E-Verify clause agree to complete a tutorial for Federal contractors with the FAR E-Verify clause.

c. Federal contractors with the FAR E-Verify clause not enrolled at the time of contract award: An Employer that is not enrolled in E-Verify at the time of a contract award must enroll as a Federal contractor with the FAR E-Verify clause in E-Verify within 30 calendar days of contract award and, within 90 days of enrollment, begin to use E-Verify to initiate verification of employment eligibility of new hires of the Employer who are working in the United States, whether or not assigned to the contract. Once the Employer begins verifying new hires, such verification of new hires must be initiated



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within 3 business days after the date of hire. Once enrolled in E-Verify as a Federal contractor with the FAR E-Verify clause, the Employer must initiate verification of employees assigned to the contract within 90 calendar days from the time of enrollment in the system and after the date and selecting which employees will be verified in E-Verify or within 30 days of an employee's assignment to the contract, whichever date is later.

d. Employers that are already enrolled in E-Verify at the time of a contract award but are not enrolled in the system as a Federal contractor with the FAR E-Verify clause: Employers enrolled in E-Verify for 90 days or more at the time of a contract award must use E-Verify to initiate verification of employment eligibility for new hires of the Employer who are working in the United States, whether or not assigned to the contract, within 3 business days after the date of hire. Employers enrolled in E-Verify as other than a Federal contractor with the FAR E-Verify clause, must update E-Verify to indicate that they are a Federal contractor with the FAR E-Verify clause within 30 days after assignment to the contract. If the Employer is enrolled in E-Verify for 90 calendar days or less at the time of contract award, the Employer must, within 90 days of enrollment, begin to use E-Verify to initiate verification of new hires of the contractor who are working in the United States, whether or not assigned to the contract. Such verification of new hires must be initiated within 3 business days after the date of hire. An Employer enrolled as a Federal contractor with the FAR E-Verify clause in E-Verify must initiate verification of each employee assigned to the contract within 90 calendar days after date of contract award or within 30 days after assignment to the contract, whichever is later.

e. Institutions of higher education, State, local and tribal governments and sureties: Federal contractors with the FAR E-Verify clause that are institutions of higher education (as defined at 20 U.S.C. 1001(a)), State or local governments, governments of Federally recognized Indian tribes, or sureties performing under a takeover agreement entered into with a Federal agency pursuant to a performance bond may choose to only verify new and existing employees assigned to the Federal contract. Such Federal contractors with the FAR E-Verify clause may, however, elect to verify all new hires, and/or all existing employees hired after November 6, 1986. The provisions of Article II.D, paragraphs 1.a and 1.b of this MOU providing timeframes for initiating employment verification of employees assigned to a contract apply to such institutions of higher education, State, local and tribal governments, and sureties.

f. Verification of all employees: Upon enrollment, Employers who are Federal contractors with the FAR E-Verify clause may elect to verify employment eligibility of all existing employees working in the United States who were hired after November 6, 1986, instead of verifying only new employees and those existing employees assigned to a covered Federal contract. After enrollment, Employers must elect to do so only in the manner designated by DHS and initiate E-Verify verification of all existing employees within 180 days after the election.

g. Form I-9 procedures for existing employees of Federal contractors with the FAR E-Verify clause: Federal contractors with the FAR E-Verify clause may choose to complete new Forms I-9 for all existing employees other than those that are completely exempt from this process. Federal contractors with the FAR E-Verify clause may also update previously completed Forms I-9 to initiate E-Verify verification of existing employees who are not completely exempt as long as that Form I-9 is complete (including the SSN), complies with Article II.C.5, the employee's work authorization has

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not expired, and the Employer has reviewed the information reflected in the Form I-9 either in person or in communications with the employee to ensure that the employee's stated basis in section 1 of the Form I-9 for work authorization has not changed (including, but not limited to, a lawful permanent resident alien having become a naturalized U.S. citizen). If the Employer is unable to determine that the Form I-9 complies with Article II.C.5, if the employee's basis for work authorization as attested in section 1 has expired or changed, or if the Form I-9 contains no SSN or is otherwise incomplete, the Employer shall complete a new I-9 consistent with Article II.C.5, or update the previous I-9 to provide the necessary information. If section 1 of the Form I-9 is otherwise valid and up-to-date and the form otherwise complies with Article II.C.5, but reflects documentation (such as a U.S. passport or Form I-551) that expired subsequent to completion of the Form I-9, the Employer shall not require the production of additional documentation, or use the photo screening tool described in Article II.C.5, subject to any additional or superseding instructions that may be provided on this subject in the Supplemental Guide for Federal Contractors. Nothing in this section shall be construed to require a second verification using E-Verify of any assigned employee who has previously been verified as a newly hired employee under this MOU, or to authorize verification of any existing employee by any Employer that is not a Federal contractor with the FAR E-Verify clause.

2. The Employer understands that if it is a Federal contractor with the FAR E-Verify clause, its compliance with this MOU is a performance requirement under the terms of the Federal contract or subcontract, and the Employer consents to the release of information relating to compliance with its verification responsibilities under this MOU to contracting officers or other officials authorized to review the Employer's compliance with Federal contracting requirements.

### **ARTICLE III**

#### **REFERRAL OF INDIVIDUALS TO SSA AND DHS**

##### **A. REFERRAL TO SSA**

1. If the Employer receives a tentative nonconfirmation issued by SSA, the Employer must print the notice as directed by the E-Verify system and provide it to the employee so that the employee may determine whether he or she will contest the tentative nonconfirmation. The Employer must review the tentative nonconfirmation with the employee in private.

2. The Employer will refer employees to SSA field offices only as directed by the automated system based on a tentative nonconfirmation, and only after the Employer records the case verification number, reviews the input to detect any transaction errors, and determines that the employee contests the tentative nonconfirmation. The Employer will transmit the Social Security Number to SSA for verification again if this review indicates a need to do so. The Employer will determine whether the employee contests the tentative nonconfirmation as soon as possible after the Employer receives it.

3. If the employee contests an SSA tentative nonconfirmation, the Employer will provide the employee with a system-generated referral letter and instruct the employee to visit an SSA office within 8 Federal Government work days. SSA will electronically transmit the result of the referral to the Employer within 10 Federal Government work days of the

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referral unless it determines that more than 10 days is necessary. The Employer agrees to check the E-Verify system regularly for case updates.

4. The Employer agrees not to ask the employee to obtain a printout from the Social Security Number database (the Numident) or other written verification of the Social Security Number from the SSA.

## **B. REFERRAL TO DHS**

1. If the Employer receives a tentative nonconfirmation issued by DHS, the Employer must print the tentative nonconfirmation notice as directed by the E-Verify system and provide it to the employee so that the employee may determine whether he or she will contest the tentative nonconfirmation. The Employer must review the tentative nonconfirmation with the employee in private.

2. If the Employer finds a photo non-match for an employee who provides a document for which the automated system has transmitted a photo, the employer must print the photo non-match tentative nonconfirmation notice as directed by the automated system and provide it to the employee so that the employee may determine whether he or she will contest the finding. The Employer must review the tentative nonconfirmation with the employee in private.

3. The Employer agrees to refer individuals to DHS only when the employee chooses to contest a tentative nonconfirmation received from DHS automated verification process or when the Employer issues a tentative nonconfirmation based upon a photo non-match. The Employer will determine whether the employee contests the tentative nonconfirmation as soon as possible after the Employer receives it.

4. If the employee contests a tentative nonconfirmation issued by DHS, the Employer will provide the employee with a referral letter and instruct the employee to contact DHS through its toll-free hotline (as found on the referral letter) within 8 Federal Government work days.

5. If the employee contests a tentative nonconfirmation based upon a photo non-match, the Employer will provide the employee with a referral letter to DHS. DHS will electronically transmit the result of the referral to the Employer within 10 Federal Government work days of the referral unless it determines that more than 10 days is necessary. The Employer agrees to check the E-Verify system regularly for case updates.

6. The Employer agrees that if an employee contests a tentative nonconfirmation based upon a photo non-match, the Employer will send a copy of the employee's Form I-551 or Form I-766 to DHS for review by:

- Scanning and uploading the document, or
- Sending a photocopy of the document by an express mail account (paid for at employer expense).

7. If the Employer determines that there is a photo non-match when comparing the photocopied List B document described in Article II.C.5 with the image generated in E-Verify, the Employer must forward the employee's documentation to DHS using one of the means described in the preceding paragraph, and allow DHS to resolve the case.



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## **ARTICLE IV**

### **SERVICE PROVISIONS**

SSA and DHS will not charge the Employer for verification services performed under this MOU. The Employer is responsible for providing equipment needed to make inquiries. To access E-Verify, an Employer will need a personal computer with Internet access.

## **ARTICLE V**

### **PARTIES**

A. This MOU is effective upon the signature of all parties, and shall continue in effect for as long as the SSA and DHS conduct the E-Verify program unless modified in writing by the mutual consent of all parties, or terminated by any party upon 30 days prior written notice to the others. Any and all system enhancements to the E-Verify program by DHS or SSA, including but not limited to the E-Verify checking against additional data sources and instituting new verification procedures, will be covered under this MOU and will not cause the need for a supplemental MOU that outlines these changes. DHS agrees to train employers on all changes made to E-Verify through the use of mandatory refresher tutorials and updates to the E-Verify User Manual, the E-Verify User Manual for Federal Contractors or the E-Verify Supplemental Guide for Federal Contractors. Even without changes to E-Verify, DHS reserves the right to require employers to take mandatory refresher tutorials. An Employer that is a Federal contractor with the FAR E-Verify clause may terminate this MOU when the Federal contract that requires its participation in E-Verify is terminated or completed. In such a circumstance, the Federal contractor with the FAR E-Verify clause must provide written notice to DHS. If an Employer that is a Federal contractor with the FAR E-Verify clause fails to provide such notice, that Employer will remain a participant in the E-Verify program, will remain bound by the terms of this MOU that apply to participants that are not Federal contractors with the FAR E-Verify clause, and will be required to use the E-Verify procedures to verify the employment eligibility of all newly hired employees.

B. Notwithstanding Article V, part A of this MOU, DHS may terminate this MOU if deemed necessary because of the requirements of law or policy, or upon a determination by SSA or DHS that there has been a breach of system integrity or security by the Employer, or a failure on the part of the Employer to comply with established procedures or legal requirements. The Employer understands that if it is a Federal contractor with the FAR E-Verify clause, termination of this MOU by any party for any reason may negatively affect its performance of its contractual responsibilities.

C. Some or all SSA and DHS responsibilities under this MOU may be performed by contractor(s), and SSA and DHS may adjust verification responsibilities between each other as they may determine necessary. By separate agreement with DHS, SSA has agreed to perform its responsibilities as described in this MOU.

D. Nothing in this MOU is intended, or should be construed, to create any right or benefit, substantive or procedural, enforceable at law by any third party against the United States, its agencies, officers, or employees, or against the Employer, its agents, officers, or employees.

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E. Each party shall be solely responsible for defending any claim or action against it arising out of or related to E-Verify or this MOU, whether civil or criminal, and for any liability wherefrom, including (but not limited to) any dispute between the Employer and any other person or entity regarding the applicability of Section 403(d) of IIRIRA to any action taken or allegedly taken by the Employer.

F. The Employer understands that the fact of its participation in E-Verify is not confidential information and may be disclosed as authorized or required by law and DHS or SSA policy, including but not limited to, Congressional oversight, E-Verify publicity and media inquiries, determinations of compliance with Federal contractual requirements, and responses to inquiries under the Freedom of Information Act (FOIA).

G. The foregoing constitutes the full agreement on this subject between DHS and the Employer.

H. The individuals whose signatures appear below represent that they are authorized to enter into this MOU on behalf of the Employer and DHS respectively.

**To be accepted as a participant in E-Verify, you should only sign the Employer's Section of the signature page. If you have any questions, contact E-Verify at 888-464-4218.**

Employer		
Name (Please Type or Print)		Title
Signature		Date
Department of Homeland Security – Verification Division		
Name (Please Type or Print)		Title
Signature		Date

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## Information Required for the E-Verify Program

**Information relating to your Company:**

Company Name:	
Company Facility Address:	
Company Alternate Address:	
County or Parish:	
Employer Identification Number:	
North American Industry Classification Systems Code:	
Administrator:	
Number of Employees:	
Number of Sites Verified for:	

**Are you verifying for more than 1 site? If yes, please provide the number of sites verified for in each State:**

State	Number of sites	Site(s)

Company ID Number: \_\_\_\_\_

**Information relating to the Program Administrator(s) for your Company on policy questions or operational problems:**

<b>Name:</b>	
<b>Telephone Number:</b>	
<b>Fax Number:</b>	
<b>E-mail Address:</b>	

**Information relating to the Program Administrator(s) for your Company on policy questions or operational problems:**

<b>Name:</b>	
<b>Telephone Number:</b>	
<b>Fax Number:</b>	
<b>E-mail Address:</b>	

B.C. # \_\_\_\_\_

## STATEMENT OF COMPLIANCE

With

**Act No. 2016-312**

“In compliance with Act 2016-312, the contractor hereby certifies that it is not currently engaged in, and will not engage in, the boycott of a person or an entity based in or doing business with a jurisdiction with which this state can enjoy open trade.”

By \_\_\_\_\_  
Signature of Officer of the Company

\_\_\_\_\_  
Date

\_\_\_\_\_  
Name and Title

\_\_\_\_\_  
Company Name

USE BLACK INK ONLY

# BID BOND

The **PRINCIPAL** (*Bidder's Name and Address*)

The **SURETY** (*Name and Principal Place of Business*)

The **OWNER** (*Name and Address*)

The **PROJECT** for which the Principal's Bid is submitted: (*Project name as it appears in the Bid Documents*)

**KNOW ALL MEN BY THESE PRESENTS**, that we, the undersigned Principal and Surety, jointly and severally, hereby bind ourselves, our heirs, executors, administrators, successors, and assigns to the Owner in the **PENAL SUM of five percent (5%) of the amount of the Principal's bid, but in no event more than Ten-thousand Dollars (\$10,000.00).**

**THE CONDITION OF THIS OBLIGATION** is that the Principal has submitted to the Owner the attached bid, which is incorporated herein by reference, for the Project identified above.

**NOW, THEREFORE**, if, within the terms of the Bid Documents, the Owner accepts the Principal's bid and the Principal thereafter either:

- (a) executes and delivers a Construction Contract with the required Performance and Payment Bonds (each in the form contained in the Bid Documents and properly completed in accordance with the bid) and delivers evidence of insurance as prescribed in the Bid Documents, or
  - (b) fails to execute and deliver such Construction Contract with such Bonds and evidence of insurance, but pays the Owner the difference, not to exceed the Penal Sum of this Bond, between the amount of the Principal's Bid and the larger amount for which the Owner may award a Construction Contract for the same Work to another bidder,
- then**, this obligation shall be null and void, otherwise it shall remain in full force and effect.

The Surety, for value received, hereby stipulates and agrees that the obligation of the Surety under this Bond shall not in any manner be impaired or affected by any extension of the time within which the Owner may accept the Principal's bid, and the Surety does hereby waive notice of any such extension.

**SIGNED AND SEALED** this \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_.

ATTEST:

**PRINCIPAL:**

\_\_\_\_\_

By \_\_\_\_\_

\_\_\_\_\_  
Name and Title

**SURETY:**

ATTEST

\_\_\_\_\_

By \_\_\_\_\_

\_\_\_\_\_  
Name and Title

# INSTRUCTIONS TO BIDDERS

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### 1. BID DOCUMENTS

The Bid Documents consist of the Advertisement for Bids, these Instructions to Bidders, any modifications of or supplements to these Instructions to Bidders, the Proposal Form, and the proposed Contract Documents. The proposed Contract Documents consist of the Construction Contract, the Performance Bond and Payment Bond, the Conditions of the Contract (General, Supplemental, and other Conditions), Drawings, Specifications and all addenda issued prior to execution of the Construction Contract. Bid Documents may be obtained or examined as set forth in the Advertisement for Bids.

### 2. GENERAL CONTRACTOR'S STATE LICENSING REQUIREMENTS:

When the amount bid for a contract exceeds \$50,000, the bidder must be licensed by the State Licensing Board for General Contractors and must show the Architect evidence of license before bidding or the bid will not be received by the Architect or considered by the Awarding Authority. A bid exceeding the bid limit stipulated in the bidder's license, or which is for work outside of the type or types of work stipulated in the bidder's license, will not be considered. In case of a joint venture of two or more contractors, the amount of the bid shall be within the maximum bid limitation as set by the State Licensing Board for General Contractors of the combined limitations of the partners to the joint venture.

### 3. QUALIFICATIONS of BIDDERS and PREQUALIFICATION PROCEDURES:

- a. Any special qualifications required of general contractors, subcontractors, material suppliers, or fabricators are set forth in the Bid Documents.
- b. The Awarding Authority may have elected to prequalify bidders. Parties interested in bidding for this contract are directed to the Advertisement for Bids and Supplemental Instructions to Bidders to determine whether bidders must be prequalified and how they may obtain copies of the Awarding Authority's published prequalification procedures and criteria.
- c. Release of Bid Documents by the Architect to a prospective bidder will not constitute any determination by the Awarding Authority or Architect that the bidder has been found to be qualified, prequalified, or responsible.

**4. PREFERENCE to RESIDENT CONTRACTORS:**

(If this project is federally funded in whole or in part, this Article shall not apply.)

a. In awarding the Contract, preference will be given to Alabama resident contractors and a nonresident bidder domiciled in a state having laws granting preference to local contractors shall be awarded the Contract only on the same basis as the nonresident bidder's state awards contracts to Alabama contractors bidding under similar circumstances.

b. A nonresident bidder is a contractor which is neither organized and existing under the laws of the State of Alabama, nor maintains its principal place of business in the State of Alabama. A nonresident contractor which has maintained a permanent office within the State of Alabama for at least five continuous years shall not thereafter be deemed to be a non-resident contractor so long as the contractor continues to maintain a branch office within Alabama.

**5. EXAMINATION of BID DOCUMENTS and the SITE of the WORK :**

Before submitting a bid for the Work, the bidders shall carefully examine the Bid Documents, visit the site, and satisfy themselves as to the nature and location of the Work, and the general and local conditions, including weather, the general character of the site or building, the character and extent of existing work within or adjacent to the site and any other work being performed thereon at the time of submission of their bids. They shall obtain full knowledge as to transportation, disposal, handling, and storage of materials, availability of water, electric power, and all other facilities in the area which will have a bearing on the performance of the Work for which they submit their bids. The submission of a bid shall constitute a representation by the bidder that the bidder has made such examination and visit and has judged for and satisfied himself or herself as to conditions to be encountered regarding the character, difficulties, quality, and quantities of work to be performed and the material and equipment to be furnished, and as to the contract requirements involved.

**6. EXPLANATIONS and INTERPRETATIONS:**

a. Should any bidder observe any ambiguity, discrepancy, omission, or error in the drawings and specifications, or in any other bid document, or be in doubt as to the intention and meaning of these documents, the bidder should immediately report such to the Architect and request clarification.

b. Clarification will be made only by written Addenda sent to all prospective bidders. Neither the Architect nor the Awarding Authority will be responsible in any manner for verbal answers or instructions regarding intent or meaning of the Bid Documents.

c. In the case of inconsistency between drawings and specifications or within either document, a bidder will be deemed to have included in its bid the better quality or greater quantity of the work involved unless the bidder asked for and obtained the Architect's written clarification of the requirements before submission of a bid.



## 7. SUBSTITUTIONS

- a.** The identification of any product, material, system, item of equipment, or service in the Bid Documents by reference to a trade name, manufacturer's name, model number, etc. (hereinafter referred to as "source"), is intended to establish a required standard of performance, design, and quality and is not intended to limit competition unless the provisions of paragraph "d" below apply.
- b.** When the Bid Documents identify only one or two sources, or three or more sources followed by "or approved equal" or similar wording, the bidder's proposal may be based on a source not identified but considered by the bidder to be equal to the standard of performance, design and quality as specified; however, such substitutions must ultimately be approved by the Architect. If the bidder elects to bid on a substitution without "Pre-bid Approval" as described below, then it will be understood that proof of compliance with specified requirements is the exclusive responsibility of the bidder.
- c.** When the Bid Documents identify three or more sources and the list of sources is not followed by "or approved equal" or similar wording, the bidder's proposal shall be based upon one of the identified sources, unless the bidder obtains "Pre-bid Approval" of another source as described below. Under these conditions it will be expressly understood that no product, material, system, item of equipment, or service that is not identified in the Bid Documents or granted "Pre-Bid Approval" will be incorporated into the Work unless such substitution is authorized and agreed upon through a Contract Change Order.
- d.** If the Bid Documents identify only one source and expressly provide that it is an approved sole source for the product, material, system, item of equipment, or service, the bidder's proposal must be based upon the identified sole source.
- e. Procedures for "Pre-bid Approval".** If it is desired that a product, material, system, piece of equipment, or service from a source different from those sources identified in the Bid Documents be approved as an acceptable source, application for the approval of such source must reach the hands of the Architect at least ten days prior to the date set for the opening of bids. At the Architect's discretion, this ten day provision may be waived. The application for approval of a proposed source must be accompanied by technical data which the applicant desires to submit in support of the application. The Architect will give consideration to reports from reputable independent testing laboratories, verified experience records showing the reputation of the proposed source with previous users, evidence of reputation of the source for prompt delivery, evidence of reputation of the source for efficiency in servicing its products, or any other pertinent written information. The application to the Architect for approval of a proposed source must be accompanied by a schedule setting forth in which respects the materials or equipment submitted for consideration differ from the materials or equipment designated in the Bid Documents. The burden of proof of the merit of the proposed substitution is upon the proposer. To be approved, a proposed source must also meet or exceed all express requirements of the Bid Documents. Approval, if granted, shall not be effective until published by the Architect in an addendum to the Bid Documents.

## 8. PREPARATION and DELIVERY of BIDS:

### a. Proposal Form:

- (1) Bids must be submitted on the Proposal Form as contained in the Bid Documents; only one copy is required to be submitted.
- (2) All information requested of the bidder on the Proposal Form must be filled in. The form must be completed by typewriter or hand-printed in ink.
- (3) Identification of Bidder: On the first page of the Proposal Form the bidder must be fully identified by completing the spaces provided for:
  - (a) the legal name of the bidder,
  - (b) the state under which laws the bidder's business is organized and existing,
  - (c) the city (and state) in which the bidder has its principal offices,
  - (d) the bidder's business organization, i.e., corporation, partnership, or individual (to be indicated by marking the applicable box and writing in the type of organization if it is not one of those listed), and
  - (e) the partners or officers of the bidder's organization, if the bidder is other than an individual. If the space provided on the Proposal Form is not adequate for this listing, the bidder may insert "See Attachment" in this space and provide the listing on an attachment to the Proposal Form.
- (4) Where indicated by the format of the Proposal Form, the bidder must specify lump sum prices in both words and figures. In case of discrepancy between the prices shown in words and in figures, the words will govern.
- (5) All bid items requested in the Proposal Form, including alternate bid prices and unit prices for separate items of the Work, must be bid. If a gross sum of bid items is requested in the Proposal Form, the gross sum shall be provided by the bidder.
- (6) In the space provided in the Proposal Form under "Bidder's Alabama License", the bidder must insert his or her current general contractor's state license number, current bid limit, and type(s) of work for which bidder is licensed.
- (7) The Proposal Form shall be properly signed by the bidder. If the bidder is:
  - (a) **an individual**, that individual or his or her "authorized representative" must sign the Proposal Form;
  - (b) **a partnership**, the Proposal Form must be signed by one of the partners or an "authorized representative" of the Partnership;
  - (c) **a corporation**, the president, vice-president, secretary, or "authorized representative" of the corporation shall sign and affix the corporate seal to the Proposal Form.

As used in these Instructions to Bidders, "authorized representative" is defined as a person to whom the bidder has granted written authority to conduct business in the bidder's behalf by signing and/or modifying the bid. Such written authority shall be

signed by the bidder (the individual proprietor, or a member of the Partnership, or an officer of the Corporation) and shall be attached to the Proposal Form.

(8) Interlineation, alterations or erasures on the Proposal Form must be initialed by the bidder or its “authorized representative”.

**b. Bid Guaranty**

(1) The Proposal Form must be accompanied by a cashier’s check, drawn on an Alabama bank, or a Bid Bond, executed by a surety company duly authorized and qualified to make such bonds in the State of Alabama, payable to the Awarding Authority.

(2) If a Bid Bond is provided in lieu of a cashier’s check, the bond shall be on the Bid Bond form as stipulated in the Bid Documents.

(3) The amount of the cashier’s check or Bid Bond shall not be less than five percent of the contractor’s bid, but is not required to be in an amount more than ten thousand dollars.

**c. Delivery of Bids:**

(1) Bids will be received until the time set, and at the location designated, in the Advertisement for Bids unless notice is given of postponement. Any bid not received prior to the time set for opening bids will be rejected absent extenuating circumstances and such bids shall be rejected in all cases where received after other bids are opened.

(2) Each bid shall be placed, together with the bid guaranty, in a sealed envelope. On the outside of the envelope the bidder shall write in large letters “Proposal”, below which the bidder shall identify the Project and the Work bid on, the name of the bidder, and the bidder’s current general contractor’s state license number.

(3) Bids may be delivered in person, or by mail if ample time is allowed for delivery. When sent by mail, the sealed envelope containing the bid, marked as indicated above, shall be enclosed in another envelope for mailing.

**9. WITHDRAWAL or REVISION of BIDS:**

**a.** A bid may be withdrawn prior to the time set for opening of bids, provided a written request, executed by the bidder or the bidder’s “authorized representative”, is filed with the Architect prior to that time. The bid will then be returned to the bidder unopened.

**b.** A bid which has been sealed in its delivery envelope may be revised by writing the change in price on the outside of the delivery envelope over the signature of the bidder or the bidder’s “authorized representative”. In revising the bid in this manner, the bidder must only write the amount of the change in price on the envelope **and must not reveal the bid price.**

**c.** Written communications, signed by the bidder or its “authorized representative”, to revise bids will be accepted if received by the Architect prior to the time set for opening bids. The Architect will record the instructed revision upon opening the bid. Such written communication

may be by facsimile if so stipulated in Supplemental Instructions to Bidders. In revising the bid in this manner, the bidder must only write the amount of the change in price **and must not reveal the bid price.**

d. Except as provided in Article 12 of these Instructions to Bidders, no bid shall be withdrawn, modified, or corrected after the time set for opening bids.

## **10. OPENING of BIDS:**

Bids will be opened and read publicly at the time and place indicated in the Advertisement for Bids. Bidders or their authorized representatives are invited to be present.

## **11. INCOMPLETE and IRREGULAR BIDS:**

A bid that is not accompanied by data required by the Bid Documents, or a bid which is in any way incomplete, may be rejected. Any bid which contains any uninitialed alterations or erasures, or any bid which contains any additions, alternate bids, or conditions not called for, or any other irregularities of any kind, will be subject to rejection.

## **12. BID ERRORS**

a. **Errors and Discrepancies in the Proposal Form.** In case of error in the extension of prices in bids, the unit price will govern. In case of discrepancy between the prices shown in the figures and in words, the words will govern.

b. **Mistakes within the Bid.** If the low bidder discovers a mistake in its bid, the low bidder may seek withdrawal of its bid without forfeiture of its bid guaranty under the following conditions:

(1) **Timely Notice:** The low bidder must notify the Awarding Authority and Architect in writing, within three working days after the opening of bids, that a mistake was made. This notice must be given within this time frame whether or not award has been made.

(2) **Substantial Mistake:** The mistake must be of such significance as to render the bid price substantially out of proportion to the other bid prices.

(3) **Type of Mistake:** The mistake must be due to calculation or clerical error, an inadvertent omission, or a typographical error which results in an erroneous sum. A mistake of law, judgment, or opinion shall not constitute a valid ground for withdrawal without forfeiture.

(4) **Documentary Evidence:** Clear and convincing documentary evidence of the mistake must be presented to the Awarding Authority and the Architect as soon as possible, but no later than three working days after the opening of bids.

The Awarding Authority's decision regarding a low bidder's request to withdraw its bid without penalty shall be made within 10 days after receipt of the bidder's evidence or by the next regular meeting of the Awarding Authority. Upon withdrawal of bid without

penalty, the low bidder shall be prohibited from (1) doing work on the project as a subcontractor or in any other capacity and (2) bidding on the same project if it is re-bid.

### **13. DISQUALIFICATION of BIDDERS:**

Any bidder(s) may be disqualified from consideration for contract award for the following reasons:

**a. Collusion.** Any agreement or collusion among bidders or prospective bidders in restraint of freedom of competition to bid at a fixed price or to refrain from bidding or otherwise shall render the bids void and shall cause the bidders or prospective bidders participating in such agreement or collusion to be disqualified from submitting further bids to the Awarding Authority on future lettings. (See § 39-2-6, Code of Alabama 1975, for possible criminal sanctions.)

**b. Advance Disclosure.** Any disclosure in advance of the terms of a bid submitted in response to an Advertisement for Bids shall render the proceedings void and require re-advertisement and rebid.

**c. Failure to Settle Other Contracts.** The Awarding Authority may reject a bid from a bidder who has not paid, or satisfactorily settled, all bills due for labor and material on other contracts in force at the time of letting.

### **14. CONSIDERATION of BIDS:**

**a.** After the bids are opened and read publicly, the bid prices will be compared and the results of this comparison will be available to the public. Until the final award of the contract, however, the Awarding Authority shall have the right to reject any or all bids, and it shall have the right to waive technical errors and irregularities if, in its judgment, the bidder will not have obtained a competitive advantage and the best interests of the Awarding Authority will be promoted.

**b.** If the Bid Documents request bids for projects or parts of projects in combination or separately, the Bid Documents must include modifications of, or supplements to, these Instructions to Bidders setting forth applicable bid procedures. Award or awards will be made to the lowest responsible and responsive bidder or bidders in accordance with such bid procedures.

### **15. DETERMINATION of LOW BIDDER by USE of ALTERNATES**

**a.** The Awarding Authority may request alternate bid prices (alternates) to facilitate either reducing the base bid to an amount within the funds available for the project or adding items to the base bid within the funds available for the project. Alternates, if any, are listed in the Proposal Form in the order in which they shall cumulatively deduct from or add to the base bid for determining the lowest bidder.

**b.** If alternates are included in the Proposal Form, the Awarding Authority shall determine the dollar amount of funds available and immediately prior to the opening of bids shall announce publicly the funds available for the project. The dollar amount of such funds shall be used to determine the lowest bidder as provided herein below, notwithstanding that the actual funds available for the project may subsequently be determined to be more or less than the expected funds available as determined immediately prior to the time of the opening of bids.

**c.** If the base bid of the lowest bidder exceeds the funds available and alternate bid prices will reduce the base bids to an amount that is within the funds available, the lowest bidder will be determined by considering, in order, the fewest number of the alternates that produces a price within the funds available. If the base bid of the lowest bidder is within the funds available and alternate bid prices will permit adding items to the base bid, the lowest bidder will be determined by considering, in order, the greatest number of the alternates that produces a price within the funds available.

**d.** After the lowest bidder has been determined as set forth above, the Awarding Authority may award that bidder any combination of alternates, provided said bidder is also the low bidder when only the Base Bid and such combination of alternates are considered.

#### **16. UNIT PRICES:**

**a. Work Bid on a Unit Price Basis.** Where all, or part(s), of the planned Work is bid on a unit price basis, both the unit prices and the extensions of the unit prices constitute a basis of determining the lowest responsible and responsive bidder. In cases of error in the extension of prices of bids, the unit price will govern. A bid may be rejected if any of the unit prices are obviously unbalanced or non-competitive.

**b. Unit Prices for Application to Change Orders.** As a means of predetermining unit costs for changes in certain elements of the Work, the Bid Documents may require that the bidders furnish unit prices for those items in the Proposal Form. Unit prices for application to changes in the work are not a basis for determining the lowest bidder. Non-competitive unit prices proposed by the successful bidder may be rejected and competitive prices negotiated by the Awarding Authority prior to contract award. Unit prices for application to changes in the work are not effective unless specifically included and agreed upon in the Construction Contract.

#### **17. AWARD of CONTRACT:**

**a.** The contract shall be awarded to the lowest responsible and responsive bidder unless the Awarding Authority finds that all the bids are unreasonable or that it is not in the best interest of the Awarding Authority to accept any of the bids. A responsible bidder is one who, among other qualities determined necessary for performance, is competent, experienced, and financially able to perform the contract. A responsive bidder is one who submits a bid that complies with the terms and conditions of the Advertisement for Bids and the Bid Documents. Minor irregularities in the bid shall not defeat responsiveness.

**b.** A bidder to whom award is made will be notified by telegram, confirmed facsimile, or letter to the address shown on the Proposal Form at the earliest possible date. Unless other

time frames are stipulated in Supplemental Instructions to Bidders, the maximum time frames allowed for each step of the process between the opening of bids and the issuance of an order to proceed with the work shall be as follows:

(1) Award of contract by Awarding Authority	30 calendar days after the opening of bids
(2) Contractor's return of the fully executed contract, with bonds and evidence of insurance, to the Awarding Authority	15 calendar days after the contract has been presented to the contractor for signature
(3) Awarding Authority's approval of the contractor's bonds and evidence of insurance and completion of contract execution	20 calendar days after the contractor presents complete and acceptable documents to the Architect
(4) Notice To Proceed issued to the contractor	15 calendar days after final execution of contract by the Awarding Authority, and by the Governor if his or her signature on the contract is required by law

The time frames stated above, or as otherwise specified in the Bid Documents, may be extended by written agreement between the parties. Failure by the Awarding Authority to comply with the time frames stated above or stipulated in Supplemental Instructions to Bidders, or agreed extensions thereof, shall be just cause for the withdrawal of the contractor's bid and contract without forfeiture of bid security.

c. Should the successful bidder or bidders to whom the contract is awarded fail to execute the Construction Contract and furnish acceptable Performance and Payment Bonds and satisfactory evidence of insurance within the specified period, the Awarding Authority shall retain from the bid guaranty, if it is a cashier's check, or recover from the principal or the sureties, if the guaranty is a bid bond, the difference between the amount of the contract as awarded and the amount of the bid of the next lowest responsible and responsive bidder, but not more than \$10,000. If no other bids are received, the full amount of the bid guaranty shall be so retained or recovered as liquidated damages for such default. Any sums so retained or recovered shall be the property of the Awarding Authority.

d. All bid guaranties, except those of the three lowest bona fide bidders, will be returned immediately after bids have been checked, tabulated, and the relation of the bids established. The bid guaranties of the three lowest bidders will be returned as soon as the contract bonds and the contract of the successful bidder have been properly executed and approved. When the award is deferred for a period of time longer than 15 days after the opening of the bids, all bid guaranties, except those of the potentially successful bidders, shall be returned. If no award is made within the specified period, as it may by agreement be extended, all bids will be rejected, and all guaranties returned. If any potentially successful bidder agrees in writing to a stipulated extension in time for consideration of its bid and its bid was guaranteed with a cashier's check, the Awarding Authority may permit the potentially successful bidder to substitute a satisfactory bid bond for the cashier's check.

END of INSTRUCTIONS TO BIDDERS

## SPECIAL INSTRUCTIONS TO BIDDERS

### INTENT OF INSTRUCTIONS

- A. The Special Instructions to Bidders are intended to amplify the abbreviated Advertisement and to give other details which shall allow interested parties to prepare bids which accurately reflect the scope of the Work. The Special Instructions to Bidders are meant to be viewed as a complement to the general Instructions to Bidders found in the Project Manual. Should any discrepancy or ambiguity be noted, the Special Instructions to Bidders shall defer to the general Instructions to Bidders.

### EXPLANATION AND INTERPRETATION

- A. Should any Bidder or subcontractor find any ambiguity, discrepancy, omission, or error in the Drawings and Project Manual, or insufficient information to provide a complete job, or be in doubt as to the intent and meaning thereof, he should at once report such in writing to Architect and request clarification prior to bidding.
- B. Clarification shall be made only by written Addenda during the bid period and sent to all perspective Bidders. The Architect and Consultants shall not be responsible for verbal answers regarding intent or meaning of the Contract Documents, or for any verbal instructions, by whomsoever made, prior to the award of the Contract.
- C. Additionally, all designed systems and/or assemblies are to be proposed and bid as complete assemblies or operational systems. Drawings are indicating intent and not attempting to fully obtain or detail required work.

### BIDDER REQUIREMENTS

- A. The Apparent Low Bidder must submit to the **Architect** a list of the principal Subcontractors, suppliers, and fabricators he plans to use for each category of work. The list of Subcontractors must be received by the Architect within 24 hours following the Bid Opening (email to: **andersong@mckeeassoc.com**). Once the successful bidder has obtained approval from the Owner, no changes in Subcontractors shall be made without the express, written consent of the Owner. Contractor shall request consent in writing from the Owner and Architect and provide specific and reasonable explanation as to the necessity of said change. Should said change be approved by the Owner, the Contractor must submit the desired replacement Subcontractor to the Architect and obtain written approval of the Subcontractor.



## OPENING OF PROPOSALS

- A. The Owner shall, according to applicable laws and regulations pertaining to bid openings, receive and review all Proposals submitted, according to the method selected below:
- 1) Proposals shall be opened and read publicly at the time and place indicated in the Advertisement.
  - 2) Proposals may be rejected if they contain any omissions, alterations of forms, additions not called for, conditional bids, alternate bids unless called for, incomplete bids, erasures, or irregularities of any kind. Proposals in which the unit or lump sum prices bid are obviously unbalanced may be rejected. Additions to or deductions from the Bid amount may be written on the outside of the sealed bid, or by letter enclosed in the sealed bid envelope.

## DETERMINATION of LOW BIDDER by USE of ALTERNATES

- A. The Awarding Authority may request alternate bid prices (alternates) to facilitate either reducing the base bid to an amount within the funds available for the project or adding items to the base bid within the funds available for the project. Alternates, if any, are listed in the Proposal Form in the order in which they shall cumulatively deduct from or add to the base bid for determining the lowest bidder.
- B. If alternates are included in the Proposal Form, the Awarding Authority shall determine the dollar amount of funds available and immediately prior to the opening of bids shall announce publicly the funds available for the project. The dollar amount of such funds shall be **used to determine the lowest bidder** as provided herein below, notwithstanding that the actual funds available for the project may subsequently be determined to be more or less than the expected funds available as determined immediately prior to the time of the opening of bids.

**If additional funds become available after the bid opening, the Owner may at his option elect to award to the lowest base bid bidder a contract based on the Contractors base bid amount and additional Alternates.**

- C. If the base bid of the lowest bidder exceeds the funds available and alternate bid prices will reduce the base bids to an amount that is within the funds available, the lowest bidder will be determined by considering, in order, the fewest number of the alternates that produces a price within the funds available.

If the base bid of the lowest bidder is within the funds available and alternate bid prices will permit adding items to the base bid, the lowest bidder will be determined by considering, in order, the greatest number of the alternates that produces a price within the funds available.

- D. After the lowest bidder has been determined as set forth above, the Awarding Authority may award that bidder any combination of alternates, provided said bidder is also the low bidder when only the Base Bid and such combination of alternates are considered.

#### AWARD OF CONTRACT

- A. The Bidder to whom the award is made shall be notified by letter to the address shown on his Proposal at the earliest possible date. At such time, at the option of the Owner, additional information such as a complete financial statement may be required from the successful Bidder.

#### EXECUTION OF CONTRACT

- A. The Contract shall be signed by the successful Bidder, in the number of counterparts provided in the Contract Agreement and returned to the Owner with satisfactory Contract Bonds within ten (10) days after the date of Notice of Award.

#### PERFORMANCE BOND AND PAYMENT BOND

- A. The intent of the Performance Bond is to ensure the faithful performance of each and every condition, stipulation, and requirements of the Contract and to indemnify and save harmless the Owner, Architect, and Consultants from any and all damages, either directly or indirectly (arising out of any failure to perform same). The successful Bidder to whom the Contract is awarded shall furnish at his expense an acceptable Performance Bond in an amount equal to one hundred percent (100%) of the Contract Price of the Contract as awarded. Said Bond shall be made on the approved Bond form, shall be furnished by a surety company duly authorized and qualified to make such bonds in the State of Alabama, shall be countersigned by an authorized agent resident in the State who is qualified for the execution of such instruments, and shall have attached thereto power of attorney of the signing official. In case of default on the part of the Contractor, all expenses incident to ascertaining and collecting losses suffered by the Owner under the Bond, the direct costs of administration, architectural, engineering, and legal services, shall lie against the Contract Bond for Performance of the Work.

- B. In addition thereto, the successful Bidder to whom the Contract is awarded shall furnish at his expense a Payment Bond with good and sufficient surety payable to the Owner in an amount not less than one hundred percent (100%) of the Contract Price, with the obligation that the Contractor shall promptly make payment to all persons furnishing him or them with labor, material, feedstuffs, or supplies for or in prosecution of the Work provided for in the Contract and for the payment or reasonable attorneys' fees, incurred by successful claimants or plaintiffs in suits on said Bond.

#### APPROVAL OF CONTRACT

- A. No Contract is binding upon the Owner until it has been executed by the Owner and the successful Bidder and copies delivered.

#### LIST OF SUBCONTRACTORS

- A. The Apparent Low Bidder must submit to the Architect a list of the principal Subcontractors, suppliers, and fabricators he plans to use for each category of work. The list of Subcontractors must be received by the Architect within twenty-four hours following the Bid Opening (email to: **andersong@mckeeassoc.com**). Once the successful bidder has obtained approval from the Owner, no changes in Subcontractors shall be made without the express, written consent of the Owner.

Category of Work	Name of Sub to Perform Work	Name of Supplier

END OF SPECIAL INSTRUCTIONS TO BID

Numbers in margin correspond to "Checklist", ABC Form B-7

**BC Project No.**

## CONSTRUCTION CONTRACT

(2) This Construction Contract is entered into this \_\_\_\_ day of \_\_\_\_ in the year of 2017  
(3) between the **OWNER(s)**,

(4) and the **CONTRACTOR**,

(5) for the **WORK** of the Project, identified as:

(6) The **CONTRACT DOCUMENTS** are dated \_\_\_\_ and have been amended by  
(7) **ADDENDA** \_\_\_\_\_.

(8) The **ARCHITECT** is McKee & Associates 631 South Hull Street, Montgomery, AL 36104

(9) The **CONTRACT SUM** is \_\_\_\_\_  
Dollars (\_\_\_\_\_) and is the sum of the Contractor's Base Bid for the Work and the  
following Alternate:

(10) **BID ALTERNATE:**

(11) The **CONTRACT TIME** is as ( ) calendar days

### **THE OWNER AND THE CONTRACTOR AGREE AS FOLLOWS:**

The Contract Documents, as defined in the General Conditions of the Contract (ABC Form C-8), are incorporated herein by reference. The Contractor shall perform the Work in accordance with the Contract Documents. The Owner will pay and the Contractor will accept as full compensation for such performance of the Work, the Contract Sum subject to additions and deductions (including liquidated damages) as provided in the Contract Documents. The Work shall be commenced on a date to be specified in a Notice to Proceed issued by the Owner or the Director, Technical Staff, Alabama Building Commission, and shall then be substantially completed within the Contract Time.

(12) **LIQUIDATED DAMAGES** for which the Contractor and its Surety (if any) shall be liable and may be required to pay the Owner in accordance with the Contract Documents shall be equal to six percent interest per annum on the total Contract Sum unless a dollar amount is stipulated in the following space, in which case liquidated damages will be assessed at a rate of 6% per annum.

(13) **SPECIAL PROVISIONS** *(Special Provisions may be inserted here, such as Acceptance or Rejection of Unit Prices.)*

A. By signing this contract, the contracting parties affirm, for the duration of the agreement, that they will not violate federal immigration law or knowingly employ, hire for employment, or continue to employ an unauthorized alien within the state of Alabama. Furthermore, a contracting party found to be in violation of this provision shall be deemed in breach of the agreement and shall be responsible for all damages resulting therefrom.

B. Article 37 "Contractors and Subcontractors Insurance" Paragraph E is modified as follows:

**E. Waivers of Subrogation, revised October 1, 2012**

The Owner and Contractor waive all rights against (1) each other and any of the subcontractors, sub-subcontractors, agents and employees, each of the other, and (2) the Architect, Architect's consultants, separate contractors performing construction or operations related to the Project, if any, and any of their subcontractors, sub-subcontractors, agents and employees, for damage cause by fire or other loss. But said waiver shall apply to the extent the loss or damage is covered by builder's risk insurance applicable to the Work or to other property located within or adjacent to the Project, except such rights as they may have to proceeds of such insurance held by the Owner or Contractor as fiduciary. The Owner or Contractor, as appropriate, shall require of the Architect, Architect's consultants, separate contractors, if any, and the subcontractor, sub-subcontractors, suppliers, agents and employees of any of them, by appropriate agreements, written where legally required for validity, similar waivers each in favor of other parties enumerated herein. The Policies shall provide such waivers of subrogation by endorsement or otherwise. A waiver of subrogation shall be effective as to the person or entity even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, did not pay insurance premium directly or indirectly, and whether or not the person or entity had an insurable interest in the property damaged. The waivers provided for in the paragraph shall not be applicable to loss or damage that occurs after final acceptance of the Work.

C. Statement of Compliance with Act No. 2016-312:

"In compliance with Act 2016-312, the contractor hereby certifies that it is not currently engaged in, and will not engage in, the boycott of a person or an entity based in or doing business with a jurisdiction with which this state can enjoy open trade."

(14) **STATE GENERAL CONTRACTOR'S LICENSE:** The Contractor does hereby certify that Contractor is currently licensed by the Alabama State Licensing Board for General Contractors and that the certificate for such license bears the following:

License No. \_\_\_\_\_ Bid Limit: \_\_\_\_\_ Classification: \_\_\_\_\_

The Owner and Contractor have entered into this Construction Contract as of the date first written above and have executed this Construction Contract in sufficient counterparts to enable each contracting party to have an originally executed Construction Contract each of which shall, without proof or accounting for the other counterparts, be deemed an original thereof.

The Owner does hereby certify that this Construction Contract was let in accordance with the provisions of Title 39, Code of Alabama 1975, as amended, and all other applicable provisions of law, and that the terms and commitments of this Construction Contract do not constitute a debt of the State of Alabama in violation of Article 11, Section 213 of the Constitution of Alabama, 1901, as amended by Amendment Number 26.

(15)

**APPROVALS**

\_\_\_\_\_  
By \_\_\_\_\_

**STATE OF ALABAMA BUILDING COMMISSION**  
(Not required for locally-funded, SDE projects.)

By \_\_\_\_\_  
Director, Technical Staff

**CONTRACTING PARTIES**

\_\_\_\_\_  
Contractor

By \_\_\_\_\_

Name & Title: \_\_\_\_\_

\_\_\_\_\_  
Owner

By \_\_\_\_\_

Name & Title \_\_\_\_\_



STATE OF ALABAMA  
BUILDING COMMISSION

770 WASHINGTON AVE  
SUITE 444  
Montgomery, Alabama 36130-1150  
Telephone: (334) 242-4082  
Fax: (334) 242-4182

ROBERT BENTLEY  
Governor

Katherine Lynn  
Director

September 29, 2014

**TO: STATE AGENCIES, K-12 SUPERINTENDENTS, COMMUNITY COLLEGES, UNIVERSITIES, OWNERS OF PRIVATE SCHOOLS, HOTELS AND MOTELS, AND MOTION-PICTURE THEATRES**

**FROM: KATHERINE LYNN, DIRECTOR**  
**ALABAMA BUILDING COMMISSION**  
*Katherine Lynn*

**SUBJECT: ADMINISTRATIVE RULE 170X-8 COLLECTION OF USER FEES**

The Alabama Building Commission has adopted a new rule, Administrative Rule 170X-8 Collection of User Fees, which will go into effect October 1, 2014. The full text of Administrative Rule 170X-8 is available on the Building Commission's website at [www.bc.alabama.gov](http://www.bc.alabama.gov).

**Summary**

A brief summary of the Administrative Rule is provided below:

**Plan Review Fee:** A plan review fee will be required for plans submitted after October 1, 2014. An initial plan review fee of 50% not to exceed \$500 will be due at the preliminary or schematic submittal and a final plan review fee for the remaining balance will be due upon receipt of the final plan submittal. No additional fee will be charged for the first revised final submittal. Additional revised final reviews (after the first revised final submittal) shall be subject to a fee equal to 15% of the final plan review fee not to exceed \$2000.

**Permit Fee:** A permit fee will be required for projects inspected by the Building Commission and bidding after October 1, 2014. The permit fee is outlined in the Administrative Rule 170X-8.

**Contract Administration Fee:** A construction administration fee will be required for construction contracts reviewed and administered by the Building Commission. The fee is equal to 1/2 of 1% of the construction contract amount. In general, the construction administration fee will apply to state agencies, community colleges and PSCA-funded projects. The construction administration fee will not apply to locally-funded K-12 projects or locally-funded higher education projects.

## **Plan Review Fees**

### **Plans Submitted for Review before October 1, 2014**

Final plans submitted before October 1, 2014 are exempt from the plan review fee. The first revised final submitted after October 1, 2014 will not be subject to the plan review fee but additional revised finals will be subject to the additional revised final review fee of 15% of the final review fee not to exceed \$2000.

### **Plans Submitted for Review after October 1, 2014**

Schematic, preliminary or final plans submitted after October 1, 2014 are subject to the plan review submittal fee. Plans submitted after October 1, 2014 are not eligible to receive an initial plan review credit even if the schematic or preliminary plans were received prior to October 1, 2014.

### **Payment of Plan Review Fees**

Plan review fee may be paid directly to the Building Commission by the Owner or, at the Owner's request, may be submitted by the architect and reimbursed to the architect by the Owner.

If submitting checks to the Building Commission, the architect must print two copies of the plan review fee form. One copy must be attached to the B-1 submittal form submitted with the plans. The other copy shall be given to the Owner and the Owner shall attach the check to the plan review fee form and submit to the Building Commission.

The 30-day review period begins on the date payment is received. The plan review fee will be refunded to the Owner for reviews not completed within 30 days.

## **Permit Fees**

### **Public Works Projects Bidding After October 1, 2014**

ABC Form C-8, "General Conditions of the Construction Contract", Article 44, Para. A, states the following:

*Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit and other permits and governmental fees, licenses and all inspections necessary for proper execution and completion of the Work which are customarily secured after award of the Construction Contract and which are in effect on the date of receipt of bids.*

For public works projects falling under the Building Commission's jurisdiction and bid after October 1, 2014, the design professional shall include a copy of the Building Commission's user fee schedule in the project manual and specify that the permit fee is to be included in the contractor's bid and paid by the Contractor.

At the Owner's option, the Owner may pay the permit fee directly to the Building Commission. However, the Pre-construction Conference cannot be held until both (1) the permit fee and (2) the signed construction contract have been received by the Building Commission.



### **Scheduling of Inspections**

The contractor will contact the design professional by e-mail of the date the project will be ready for an inspection.

The design professional will contact the Building Commission (BC) Inspector to schedule the first available date for the inspection. Inspections must be requested 14 days in advance.

When the BC Inspector confirms the inspection time, the design professional will send an e-mail confirming the inspection time and date. The e-mail must be sent to the contractor, BC Inspector, owner and the BC main office ([jennie.jones@bc.alabama.gov](mailto:jennie.jones@bc.alabama.gov)). All requests for inspections must come from the design professional and sent to the BC Inspector with copies to the contractor, owner, and BC main office ([jennie.jones@bc.alabama.gov](mailto:jennie.jones@bc.alabama.gov)).

Cancellations of any scheduled inspection must be received in writing by e-mail no less than 48 hours prior to the scheduled inspection. The e-mail must be sent to the contractor, BC inspector, owner and the BC main office ([jennie.jones@bc.alabama.gov](mailto:jennie.jones@bc.alabama.gov)). If an inspection is cancelled, it will be rescheduled subject to the BC Inspector's availability.

If an inspection is cancelled less than 48 hours prior to the scheduled inspection, the re-inspection fee of \$1500 will be charged.

### **Minimum Requirements for Required Inspections**

The following minimum requirements listed below are provided to aid the contractors and architects in determining if a project is ready for a required inspection.

#### **Pre-Construction Conference**

Required Attendees: Contractor, Owner, Architect, Major Subcontractors

Inspection Requirements:

- Signed construction contract
- Verification of payment of permit fee
- Contractor's Statement of Responsibility and Quality Assurance Plan (for storm shelter)
- Fire Alarm Contractor's Certification (from State Fire Marshal)
- ADEM permit, if more than 1 acre of land is disturbed

#### **Pre-Construction Conference for Storm Shelter**

Required Attendees: Contractor, Owner, Architect, Structural Engineer, Major Subcontractors, Special Inspections Representative

Inspection Requirements:

- BC Inspector must have already received Contractor's Statement of Responsibility and Quality Assurance Plan

#### **Pre-Roofing Conference**

Required Attendees: Contractor, Owner, Architect, Roofing Subcontractor, Roofing Manufacturer's Representative

Inspection Requirements:

- Roofing submittals **must be approved by the architect** prior to pre-roofing conference
- Roofing manufacturer must provide documentation that roof design and roofing materials meet code requirements for wind uplift and impact resistance
- Copy of sample roofing warranty

#### Above-Ceiling Inspections

Required Attendees: Contractor, Owner, Architect, MEP Engineers, Major Subcontractors

Inspection Requirements:

- All work must be completed except for installation of ceiling tiles and/or hard ceilings
- Space must be conditioned
- Permanent power must be connected unless otherwise arranged with the BC Inspector
- Grease duct must be inspected and approved by the BC Inspector prior to fire wrapping and Above-Ceiling Inspection

#### Life Safety Inspections and Final Inspections

Required Attendees: Contractor, Owner, Architect, Engineers, Major Subcontractors, Local Fire Marshal

Inspection Requirements:

- Fire alarm certification
- Kitchen hood fire suppression system certification
- General Contractor's 5-Year Roofing Warranty (ABC Form C-9)
- Roofing manufacturer's guaranty
- Above ground and below ground sprinkler certifications
- Completed Certificate of Structural Engineer's Observations for storm shelters
- Emergency and exit lighting tests
- **Fire alarm must be monitored**
- Elevator Inspection completed and Certificate of Operation provided by the State of Alabama Department of Labor
- Boiler/Vessels Inspection completed and Certificate of Operation provided by the State of Alabama Department of Labor
- Flush test for underground sprinkler lines (witnessed by local fire marshal, fire chief and/or BC Inspector)
- Flush/pressure test for new and/or existing fire hydrants
- Must have clear egress/access and emergency (for first responders) access to building
- Must have ADA access completed

#### Year-End Inspections

Required Attendees: Contractor, Owner, Architect, Engineers and/or Major subcontractors may also be required to attend

Inspection Requirements:

- Owner's list of documented warranty items

### **Contract Administration Fee**

The contract administration fee is applicable only to projects where the contract documents (Owner-Architect agreements, amendments, construction contracts, change orders and modifications) are reviewed, approved and administered by the Building Commission. In general, this includes state agencies, community colleges, PSCA-funded projects and other bond funded projects. The construction administration fee is not applicable to locally-funded K-12 projects or locally-funded higher education projects which are not reviewed by the Building Commission.

The contract administration fee shall be due as follows:

- Half of the fee will be due upon receipt of the Owner-Architect Agreement. The fee shall be equal to  $\frac{1}{4}$  of 1% of the estimated Cost of the Work.
- Half of the fee will be due upon receipt of the Construction Contract. The fee shall be equal to  $\frac{1}{4}$  of 1% of the Construction Contract amount.

### **Final Reconciliation**

A request for the contractor's final pay application will be sent to the Owner with the executed Certificate of Substantial Completion. An invoice for the final reconciliation of the plan review fee and permit fee shall be sent to the Owner after the contractor's final pay application is received. Payment for the final reconciliation of the permit fee, the plan review fee, and contract administration fee (if applicable) must be received prior to the year-end inspection.

### **Payment Options**

- Fees may be paid by check or money order mailed directly to the Building Commission
- An option to make on-line payments will be available through the Building Commission's website in early October 2014. On-line payments may be made by credit card or by e-check. Credit card transactions will be charged an additional 3.5% surcharge and e-check transactions will be charged an additional \$3 per transaction (must be drawn from a U.S. banking institution).
- Electronic payments can only be made for each individual project and cannot be combined for multiple projects.
- State agencies who wish to pay using inter-agency transfer must contact Chris McCracken at 334-353-3205 or [chris.mccracken@bc.alabama.gov](mailto:chris.mccracken@bc.alabama.gov) or Jennie Jones at 334-242-4808 or [jennie.jones@bc.alabama.gov](mailto:jennie.jones@bc.alabama.gov).

If you have any questions, please contact Katherine Lynn at the Alabama Building Commission at (334) 242-4082 or by e-mail at [Katherine.lynn@bc.alabama.gov](mailto:Katherine.lynn@bc.alabama.gov).

cc: Mr. Ben Albritton, Assistant Attorney General

Dept Use Only
Invoice # _____
Date Paid _____
Confirmation # _____

## PERMIT FEE CALCULATION WORKSHEET

BC # \_\_\_\_\_ DATE \_\_\_\_\_

PROJECT NAME \_\_\_\_\_

OWNER \_\_\_\_\_ ARCHITECT \_\_\_\_\_

CONTRACTOR \_\_\_\_\_

AWARDED CONTRACT AMOUNT \_\_\_\_\_

### Calculation of Fee:

Less than \$1,000     N/A

#### \$1,001 - \$50,000

Cost of Work less \$ 1,000= \_\_\_\_\_ /1,000 x \$5.00= \_\_\_\_\_ +\$15.00= \_\_\_\_\_

#### \$50,000 - \$100,000

Cost of Work less \$50,000= \_\_\_\_\_ /1,000 x \$4.00= \_\_\_\_\_ +\$260.00= \_\_\_\_\_

#### \$100,000 - \$500,000

Cost of Work less \$100,000= \_\_\_\_\_ /1,000 x \$3.00= \_\_\_\_\_ +\$460.00= \_\_\_\_\_

#### \$500,001 and up

Cost of Work less \$500,000= \_\_\_\_\_ /1,000 x \$2.00= \_\_\_\_\_ +\$1,660.00= \_\_\_\_\_

The PERMIT FEE is to be paid before scheduling the Pre-Construction Conference. The PERMIT FEE is based on the awarded construction contract amount. A copy of the signed construction contract must be received prior to the Pre-Construction Conference.

The FINAL RECONCILIATION OF PERMIT FEE must be paid prior to the Year-End Inspection. The FINAL RECONCILIATION OF PERMIT FEE is based on the Contractor's Final Pay Application including all change orders and sales tax credits received by the Owner.



JULIE P. MAGEE  
Commissioner

# State of Alabama Department of Revenue

([www.revenue.alabama.gov](http://www.revenue.alabama.gov))  
50 North Ripley Street  
Montgomery, Alabama 36132

MICHAEL E. MASON  
Assistant Commissioner

JOE W. GARRETT, JR.  
Deputy Commissioner

CURTIS E. STEWART  
Deputy Commissioner

## Alabama Department of Revenue NOTICE

### Tax Guidance for Contractors, Subcontractors and Alabama Governmental Entities Regarding Construction-related Contracts

Legislative Act 2013-205 requires the Department of Revenue to issue Form STC-1, *Sales and Use Tax Certificate of Exemption for Government Entity Projects*, to all contractors and subcontractors working on qualifying governmental entity projects once the Form ST: EXC-01 is approved.

Each exempt entity, contractor and subcontractor must make application for qualification of the exemption using Form ST: EXC-01 for each tax-exempt project. The application is available on the department's website at <http://revenue.alabama.gov/salestax/ST-EXC-01.pdf>. Applications should be submitted directly to the Sales and Use Tax Division Central Office, P.O. Box 327710, Montgomery, AL 36132-7710.

The sales and use tax exemption provided for in Act 2013-205 applies to the purchase of building materials, construction materials and supplies, and other tangible personal property that become part of the structure pursuant to a qualifying contract entered into on or after January 1, 2014. Qualifying projects and contracts are those generally entered into with the following governmental entities, unless otherwise noted: the State of Alabama, a county or incorporated municipality of Alabama, an Alabama public school, or an Alabama industrial or economic development board or authority already exempt from sales and use taxes. **Please note that contracts entered into with the federal government and contracts pertaining to highway, road, or bridge construction or repair do not qualify for the exemption provided for in Act 2013-205.** [Reference: Sales and Use Tax Division Administrative Rule 810-6-3-.77 *Exemption for Certain Purchases by Contractors and Subcontractors in Conjunction with Construction Contracts with Certain Governmental Entities*.]

The Alabama Department of Revenue will assign each contractor and sub-contractor a consumers use tax account, if one is currently not in place, at the time the Form STC-1, *Sales and Use Tax Certificate of Exemption for Government Entity Projects*, is issued.

Contractors and sub-contractors for qualifying projects will be required to file monthly consumers use tax returns and report all exempt purchases for ongoing projects, as well as all taxable purchases on one return. These returns are required to be filed through the department's online tax return filing and payment portal, My Alabama Taxes (<https://myalabamataxes.alabama.gov>).

As another option for these types of contracts, as well as with other contracts entered into with other types of exempt entities, the Form ST:PAA1, *Purchasing Agent Appointment*, may be used. However, please be advised that the use of the Form ST:PAA1 option will require the exempt entity to be invoiced directly and pay for directly from their funds any construction and building material and supply purchases.

For additional information concerning this guidance, taxpayers should contact Sales and Use Tax Division representative Thomas Sims at 334-242-1574 or by email at [Thomas.Sims@revenue.alabama.gov](mailto:Thomas.Sims@revenue.alabama.gov).

## *General Information and Instructions Regarding the Reporting Requirements for Contractors Awarded an Exemption Certificate*

A contractor's exemption certificate for a Government Entity project is needed in order to purchase materials tax exempt for the qualified project. Once the exemption certificate has been applied for and awarded, there is a monthly filing requirement to report the purchases that have been made for each exempt project. The Consumer's Use (CNU) tax account is used to report the tax-exempt purchases made with each certificate for each exempt project for each month.

The consumer's use tax return must be filed for each of the months covered by the exemption certificate. (For example, if the certificate's effective date is June 29, 2014 and the expected completion date is October 1, 2014, a consumer's use tax return must be filed for each of the following months: June, July, August, September, and October.) A return **MUST** be filed each month to report the monthly purchases. Therefore, all active exemption certificates must be included on the monthly report even if the monthly purchases for a specific project was \$0..

If a CNU tax account is not already open under the taxpayer/business name, one will automatically be assigned at the time the exemption certificate is generated. Electronic filing is required through the Department's online filing system, My Alabama Taxes (MAT). A letter containing the online filing information will be mailed to the address on file within a few days after the new CNU tax account has been assigned. This letter will contain all the information needed to create your online filing account in MAT. For questions relating to setting up the account on [www.myalabamataxes.alabama.gov](http://www.myalabamataxes.alabama.gov), please contact Business Registration at 334-242-1584 or the Sales Tax Division at 1-866-576-6531.

Once the MAT account is set up, please log in and file the monthly CNU tax return. There is a table located at the bottom left hand corner labeled "Contractor's Exemption for Government Construction Projects." All three fields in the table are required to be completed: exemption number, project number, and total amount of purchases for that specific project for the month. Additional projects may be added on the additional rows that appear as data is added; the table will allow the addition of more projects.

\*\*\*Please do not use lines 1 through 9 of the return for reporting exempt project information. Leave these lines blank unless taxable purchases were made outside of the state of Alabama that need to be reported and tax remitted. (Lines 1 through 9 do not have anything to do with the exemption reporting requirements).

When the certificate expires (upon the project's completion) and the CNU tax account is no longer needed, please contact the Business Registration Unit at 334-242-1584 and close the CNU tax account. Please be advised that if there are multiple government entity projects open, the consumer's use tax account should remain open until the last project completion date. For example, if Project EXC00ABCD ends in June of 2014 but Project EXC00EFGH ends January of 2015, the CNU tax account must remain open until the end of January 2015. A return for Project EXC00EFGH must be filed all the way through January 2015.

If the applicant already has a CNU tax account and it is currently set up online, please use this account to report exempt project purchases through [www.myalabamataxes.alabama.gov](http://www.myalabamataxes.alabama.gov) using the instructions provided above. The return may then be filed as usual.

\*\*\*All Consumer's Use Tax returns are due on the 20th of the month following the month in which purchases were made (i.e., the return for the month of June is due July 20th, etc. There are 20 days to file the return before it is deemed late.)

\*\*\*Any penalty waiver requests may be directed to the Sales and Use Tax Division at 1-866-576-6531. Only one waiver per 18 month period is allowed.

## Instructions For Preparation of Form ST: EXC-01 Sales and Use Tax Certificate of Exemption for Government Entity Project

NOTE: Exemption Certificates will be issued as of the project start date or the received date of the application. If, upon receipt of the application, the project has already commenced, the certificate will be issued as of the received date of the application. Any purchases made prior to the issuance of a certificate will not be exempt.

**\*\*\* Please allow 10 to 14 business days for your application to be processed. \*\*\***

In order to expedite the processing of your application, please include the following documentation when submitting your application:

**Exempt Entity:**

1. Signed Application
2. Copy of Executed/Signed Contract, Letter of Intent, Notice of Award, and/or Notice to Proceed

**General Contractor:**

1. Signed Application
2. Copy of Executed/Signed Contract, Letter of Intent, Notice of Award, and/or Notice to Proceed
3. List of Sub-Contractors
4. Alabama Board of General Contractor's License
5. State/County Business License (usually obtained through county probate office)
6. Any other municipal business licenses associated with the project

**Sub-Contractor:**

1. Signed Application
2. Alabama Board of General Contractor's License
3. State/County Business License (usually obtained through county probate office)
4. Any other municipal business licenses associated with the project
5. List of Sub-Contractors (if any)

**General contractors and sub-contractors:**

- Any additions and/or deletions to the list of sub-contractors working on a project must be submitted to the Department within 30 days of occurrence.
- If an extension is needed for a project, please contact the Department of Revenue at the address, numbers, or emails listed below.
- Sub-Contractor's Estimated Start Date should be the date they will begin working on the project and ordering materials instead of the General Contractor's Estimated Start Date for the project.

THERE IS A FILING REQUIREMENT IF YOUR APPLICATION IS APPROVED. The return will be filed through the Consumer's Use Tax account. Please see the following page for detailed instructions and general information regarding the reporting requirements.

The application and required documentation may be mailed, faxed, or emailed to the following:

Fax: (334) 353-7867

Emails: [STExemptionUnit@revenue.alabama.gov](mailto:STExemptionUnit@revenue.alabama.gov)

Mailing Address: ATTN: Contractor's Exemption  
Alabama Department of Revenue  
Sales & Use Tax Division  
Room 4303  
PO Box 327710  
Montgomery, AL 36132-7710



ALABAMA DEPARTMENT OF REVENUE  
SALES AND USE TAX DIVISION  
P.O. Box 327710 • Montgomery, AL 36132-7710

ST: EXC-01  
8/16

# Application For Sales and Use Tax Certificate of Exemption

## FOR GOVERNMENT ENTITY PROJECT

This Certificate of Exemption will be limited to purchases which qualify for an exemption of sales and use taxes pursuant to Rule No. 810-6-3-.77

### PROJECT INFORMATION:

PROJECT NAME			PROJECT OWNER'S FEIN (EXEMPT ENTITY)		
STREET ADDRESS OF PROJECT (CITY AND COUNTY INCLUDED)		CITY	ZIP	COUNTY	

### APPLICANT'S INFORMATION:

RELATION: (CHOOSE ONE)

☐ Government Entity ☐ General Contractor ☐ Sub-Contractor

APPLICANT'S LEGAL NAME			FEIN		
DBA			CONSUMER'S USE TAX ACCOUNT NUMBER		
MAILING ADDRESS: STREET		CITY	STATE	ZIP	COUNTY

CONTACT PERSON			BUSINESS TELEPHONE NUMBER (      )		
EMAIL ADDRESS					

PROJECT START DATE (PROVIDED BY GENERAL CONTRACTOR)		PROJECT COMPLETION DATE (PROVIDED BY GENERAL CONTRACTOR)	
ESTIMATED START DATE (FOR APPLICANT)		ESTIMATED COMPLETION DATE (FOR APPLICANT)	
WILL THE APPLICANT HAVE ANY SUB-CONTRACTORS ON THIS JOB? <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, please attach list.		NAME OF PARTY WITH WHOM YOUR CONTRACT IS WITH	

JOB DESCRIPTION		
WILL ANY POLLUTION CONTROL EXEMPTION BE APPLICABLE? <input type="checkbox"/> Yes <input type="checkbox"/> No		ESTIMATED POLLUTION CONTROL COST \$
TOTAL PROJECT BID AMOUNT (APPLICANT'S PORTION OF PROJECT) \$	LABOR COST (APPLICANT'S PORTION OF PROJECT) \$	MATERIAL COST (APPLICANT'S PORTION OF PROJECT) \$

### REVENUE DEPARTMENT USE ONLY

PENDING DOCUMENTATION / INFORMATION:

☐ GCL ☐ SBL ☐ Contract / NTP / LOI ☐ LOS ☐ Project Dates / Breakdown of Costs

Contact Dates: \_\_\_\_\_ Received Date: \_\_\_\_\_  
Forwarded for Denial: \_\_\_\_\_



PROJECT NAME

PROJECT OWNER'S FEIN (EXEMPT ENTITY)

FORM OF OWNERSHIP:

☐ Individual ☐ Partnership ☐ Corporation ☐ Multi member LLC ☐ Single member LLC ☐ Government Entity

If applicant is a corporation, a copy of the certified certificate of incorporation, amended certificate of incorporation, certificate of authority, or articles of incorporation should be attached. If the applicant is a limited liability company or a limited liability partnership, a copy of the certified articles of organization should be attached.

OWNERSHIP INFORMATION:

Corporations – give name, title, home address, and Social Security Number of each officer.

Partnerships – give name, home address, Social Security Number or FEIN of each partner.

Sole Proprietorships – give name, home address, Social Security Number of owner.

LLC – give name, home address, and Social Security Number or FEIN of each member.

LLP – give name, home address, and Social Security Number or FEIN of each partner.

NAME (PLEASE PRINT)

SIGNATURE

TITLE

DATE

REVENUE DEPARTMENT USE ONLY

PENDING OTHER:

☐ Government Entity ☐ General Contractor ☐ Not on LOS

Contact Dates: \_\_\_\_\_ Received Date: \_\_\_\_\_

Forwarded for Denial: \_\_\_\_\_

Examiner's Remarks \_\_\_\_\_

Examiner \_\_\_\_\_ Date \_\_\_\_\_

## **Vendor Disclosure Statement Information and Instructions**

Act 2001-955 requires the disclosure statement to be completed and filed with all proposals, bids, contracts, or grant proposals to the State of Alabama in excess of \$5,000. The disclosure statement is not required for contracts for gas, water, and electric services where no competition exists, or where rates are fixed by law or ordinance. In circumstances where a contract is awarded by competitive bid, the disclosure statement shall be required only from the person receiving the contract and shall be submitted within ten (10) days of the award.

A copy of the disclosure statement shall be filed with the awarding entity and the Department of Examiners of Public Accounts and if it pertains to a state contract, a copy shall be submitted to the Contract Review Permanent Legislative Oversight Committee. The address for the Department of Examiners of Public Accounts is as follows: 50 N. Ripley Street, Room 3201, Montgomery, Alabama 36130-2101. If the disclosure statement is filed with a contract, the awarding entity should include a copy with the contract when it is presented to the Contract Review Permanent Legislative Oversight Committee.

The State of Alabama shall not enter into any contract or appropriate any public funds with any person who refuses to provide information required by Act 2001-955.

Pursuant to Act 2001-955, any person who knowingly provides misleading or incorrect information on the disclosure statement shall be subject to a civil penalty of ten percent (10%) of the amount of the transaction, not to exceed \$10,000.00. Also, the contract or grant shall be voidable by the awarding entity.

### **Definitions as Provided in Act 2001-955**

**Family Member of a Public Employee** - The spouse or a dependent of the public employee.

**Family Member of a Public Official** - The spouse, a dependent, an adult child and his or her spouse, a parent, a spouse's parents, a sibling and his or her spouse, of the public official.

**Family Relationship** - A person has a family relationship with a public official or public employee if the person is a family member of the public official or public employee.

**Person** - An individual, firm, partnership, association, joint venture, cooperative, or corporation, or any other group or combination acting in concert.

**Public Official and Public Employee** - These terms shall have the same meanings ascribed to them in Sections 36-25-1(23) and 36-25-1(24), Code of Alabama 1975, (see below) except for the purposes of the disclosure requirements of this act, the terms shall only include persons in a position to influence the awarding of a grant or contract who are affiliated with the awarding entity. Notwithstanding the foregoing, these terms shall also include the Governor, Lieutenant Governor, members of the cabinet of the Governor, and members of the Legislature.

Section 36-25-1(23), Code of Alabama 1975, defines a public employee as any person employed at the state, county or municipal level of government or their instrumentalities, including governmental corporations and authorities, but excluding employees of hospitals or other health care corporations including contract employees of those hospitals or other health care corporations, who is paid in whole or in part from state, county, or municipal funds. For purposes of this chapter, a public employee does not include a person employed on a part-time basis whose employment is limited to providing professional services other than lobbying, the compensation for which constitutes less than 50 percent of the part-time employee's income.

Section 36-25-1(24), Code of Alabama 1975, defines a public official as any person elected to public office, whether or not that person has taken office, by the vote of the people at state, county, or municipal level of government or their instrumentalities, including governmental corporations, and any person appointed to a position at the state, county, or municipal level of government or their instrumentalities, including governmental corporations. For purposes of this chapter, a public official includes the chairs and vice-chairs or the equivalent offices of each state political party as defined in Section 17-16-2, Code of Alabama 1975.

### **Instructions**

Complete all lines as indicated. If an item does not apply, denote N/A (not applicable). If you cannot include required information in the space provided, attach additional sheets as necessary.

The form must be signed, dated, and notarized prior to submission.



# State of Alabama Disclosure Statement

(Required by Act 2001-955)

ENTITY COMPLETING FORM

ADDRESS

CITY, STATE, ZIP

TELEPHONE NUMBER

( )

STATE AGENCY/DEPARTMENT THAT WILL RECEIVE GOODS, SERVICES, OR IS RESPONSIBLE FOR GRANT AWARD

ADDRESS

CITY, STATE, ZIP

TELEPHONE NUMBER

( )

This form is provided with:

☐

Contract

☐

Proposal

☐

Request for Proposal

☐

Invitation to Bid

☐

Grant Proposal

Have you or any of your partners, divisions, or any related business units previously performed work or provided goods to any State Agency/Department in the current or last fiscal year?

☐

Yes

☐

No

If yes, identify below the State Agency/Department that received the goods or services, the type(s) of goods or services previously provided, and the amount received for the provision of such goods or services.

STATE AGENCY/DEPARTMENT	TYPE OF GOODS/SERVICES	AMOUNT RECEIVED
-------------------------	------------------------	-----------------

Have you or any of your partners, divisions, or any related business units previously applied and received any grants from any State Agency/Department in the current or last fiscal year?

☐

Yes

☐

No

If yes, identify the State Agency/Department that awarded the grant, the date such grant was awarded, and the amount of the grant.

STATE AGENCY/DEPARTMENT	DATE GRANT AWARDED	AMOUNT OF GRANT
-------------------------	--------------------	-----------------

1. List below the name(s) and address(es) of all public officials/public employees with whom you, members of your immediate family, or any of your employees have a family relationship and who may directly personally benefit financially from the proposed transaction. Identify the State Department/Agency for which the public officials/public employees work. (Attach additional sheets if necessary.)

NAME OF PUBLIC OFFICIAL/EMPLOYEE	ADDRESS	STATE DEPARTMENT/AGENCY
----------------------------------	---------	-------------------------

OVER

2. List below the name(s) and address(es) of all family members of public officials/public employees with whom you, members of your immediate family, or any of your employees have a family relationship and who may directly personally benefit financially from the proposed transaction. Identify the public officials/public employees and State Department/Agency for which the public officials/public employees work. (Attach additional sheets if necessary.)

NAME OF FAMILY MEMBER	ADDRESS	NAME OF PUBLIC OFFICIAL/ PUBLIC EMPLOYEE	STATE DEPARTMENT/ AGENCY WHERE EMPLOYED
-----------------------	---------	---	--

If you identified individuals in items one and/or two above, describe in detail below the direct financial benefit to be gained by the public officials, public employees, and/or their family members as the result of the contract, proposal, request for proposal, invitation to bid, or grant proposal. (Attach additional sheets if necessary.)

Describe in detail below any indirect financial benefits to be gained by any public official, public employee, and/or family members of the public official or public employee as the result of the contract, proposal, request for proposal, invitation to bid, or grant proposal. (Attach additional sheets if necessary.)

List below the name(s) and address(es) of all paid consultants and/or lobbyists utilized to obtain the contract, proposal, request for proposal, invitation to bid, or grant proposal:

NAME OF PAID CONSULTANT/LOBBYIST	ADDRESS
----------------------------------	---------

***By signing below, I certify under oath and penalty of perjury that all statements on or attached to this form are true and correct to the best of my knowledge. I further understand that a civil penalty of ten percent (10%) of the amount of the transaction, not to exceed \$10,000.00, is applied for knowingly providing incorrect or misleading information.***

Signature	Date
-----------	------

Notary's Signature	Date	Date Notary Expires
--------------------	------	---------------------

Act 2001-955 requires the disclosure statement to be completed and filed with all proposals, bids, contracts, or grant proposals to the State of Alabama in excess of \$5,000.



STATE OF ALABAMA  
BUILDING COMMISSION

770 WASHINGTON AVE  
SUITE 444  
Montgomery, Alabama 36130-1150  
Telephone: (334) 242-4082  
Fax: (334) 242-4182

Robert Bentley  
Governor

Katherine Lynn  
Director

May 29, 2012

**TO: ARCHITECTS AND ENGINEERS**

**FROM: KATHERINE LYNN, DIRECTOR**  
**ALABAMA BUILDING COMMISSION**  
*Katherine Lynn*

**SUBJECT: GUIDANCE ON ACT 2012-491 AMENDING THE ALABAMA IMMIGRATION LAW**

The Alabama Immigration Law (also referred to as "Act 2011-535" and codified in state law as Title 31, Chapter 13 of the Code of Alabama 1975) was amended by Act No. 2012-491 which was signed by Governor Bentley on May 18, 2012. Upon signature, the following requirements went into effect:

1. Contractors (including architects and engineers) will no longer be required to provide an affidavit nor will they be required to obtain affidavits from their subcontractors or consultants.
2. Contractors (including architects and engineers) will still be required to enroll in the E-Verify program and to provide documentation of enrollment in the E-Verify program with their contracts or agreements.
3. All contracts and agreements must now include the following statement:

***By signing this contract, the contracting parties affirm, for the duration of the agreement, that they will not violate federal immigration law or knowingly employ, hire for employment, or continue to employ an unauthorized alien within the state of Alabama. Furthermore, a contracting party found to be in violation of this provision shall be deemed in breach of the agreement and shall be responsible for all damages resulting therefrom.***

The departments that have previously issued guidance on compliance may revise their guidance based on Act No. 2012-491. Architects, engineers and contractors are urged to continue checking the websites for the State Department of Education, the Alabama Community College System and State Comptroller's Office for the latest information.

To aid in compliance, any contract received at the Building Commission after May 18, 2012 that does not include the required contract clause and E-Verify Memorandum of Understanding will be returned.

The websites for each department include their points of contact for questions or you may contact me at (334) 242-4082.

Cc: Mr. Perry Taylor, State School Architect  
Ms. Lynne Thrower, General Counsel/Vice Chancellor, Legal and Human Resources  
Mr. Thomas White, Jr., State Comptroller

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## REVISED

### Alabama Immigration Law Guidance for School Boards

The Beason-Hammon Alabama Taxpayer and Citizen Protection Act (Act No. 2011-535) includes several sections that affect the financial operations of Alabama school boards. Legislation amending certain sections of Act No. 2011-535 has been signed by Governor Bentley and is available on the Secretary of State's web page as Act No. 2012-491. [Act 2011-535 is codified in state laws as Title 31, Chapter 13 of the Code of Alabama 1975.]

- A.* Effective April 1, 2012, every business entity or employer in Alabama is required to enroll in E-Verify and follow the related federal law and regulations for verifying the employment eligibility of newly hired employees using the E-Verify program. [See Section 31-13-15(b)].
- B.* Two other sections of the law require business entities and employers with one or more employees working in Alabama to utilize the E-Verify program for newly hired employees as a condition of a contract, grant, or incentive awarded by a public entity on or after January 1, 2012. [See Section 31-13-9(a) & (b) and Section 31-13-25(b)].

*A. Employees.* After enrolling in the federal E-Verify program, the school board is required to verify the immigration status of a newly hired employee (including a substitute employee) as part of the employment process by utilizing the E-Verify program. School boards are prohibited by federal laws from using E-Verify to pre-screen potential employees. However, school boards may inform applicants and potential employees that the school board now uses the federal E-Verify program for newly hired employees by providing the following notification:

Alabama school boards are required by state law to verify the employment eligibility of newly hired employees by using the federal E-Verify program. New employees are required to provide a Social Security number, an unexpired identity document that contains a photograph, and other acceptable documents that establish employment eligibility. In addition to determining whether a new hire is authorized to work in the United States, E-Verify will confirm that the employee's name and Social Security number match. The U. S. Department of Homeland Security (DHS) has a service for employees to check their own employment authorization status before going through the E-Verify process at a new job. The E-Verify Self Check gives new employees some additional time to correct any problems they find with their DHS or Social Security Administration records before employment begins. Self Check is located on the right side of the E-Verify web site [www.uscis.gov/everify](http://www.uscis.gov/everify).

*B. Contracts.* Effective January 1, 2012, when the school board awards a contract or grant to a business entity or employer (that has one or more employees working in Alabama), Section 31-13-9(a) requires that the school board obtain a notarized affidavit and documentation of enrollment in the E-Verify program. **Act No. 2012-491 removed the affidavit requirement and now defines the term "contract" as "...a contract awarded by the state, any political subdivision thereof, or any state-funded entity that was competitively bid..."**

**B. Contracts (continued).** Business entities or employers with one or more employees working in Alabama should be notified of the requirements to enroll in the E-Verify program before the contract is signed or bids are awarded. The E-Verify documentation may not be necessary for some contracts awarded by the school board because the contracting entity does not have any employees working in Alabama. The law does not address the documentation required in these situations. A letter, fax, e-mail, or some type of documentation should be obtained from the business entity or employer stating that the contracting entity does not have any employees working in Alabama.

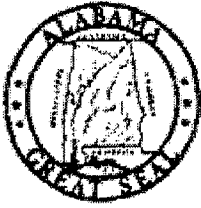
State law does not require that bid specifications include specific language addressing the requirements of the Beason-Hammon Alabama Taxpayer and Citizen Protection Act. However, including the immigration requirements in the bid specifications would be beneficial in approving the contract after the bid is awarded. Including the following language in bid specifications could avoid questions from potential bidders:

Alabama laws require that, as a condition for the award of a contract by a school board to a business entity or employer with one or more employees working in Alabama, the business entity or employer must provide documentation of enrollment in the E-Verify program. During the performance of the contract, the business entity or employer shall participate in the E-Verify program and shall verify every employee that is required to be verified according to the applicable federal rules and regulations. The contractor's E-Verify Memorandum of Understanding must be included with the bid. If you do not believe these requirements are applicable to your entity, include an explanation justifying such exemption. An entity can obtain the E-Verify Memorandum of Understanding upon completion in the E-Verify enrollment process located at the federal web site [www.uscis.gov/everify](http://www.uscis.gov/everify). The Alabama Department of Homeland Security (<http://immigration.alabama.gov>) has also established an E-Verify employer agent account for any business entity or employer with 25 or fewer employees that will provide a participating business entity or employer with the required documentation of enrollment in the E-Verify program. An Employer Identification Number (EIN), also known as a Federal Tax Identification Number, is required to enroll in E-Verify or to establish an E-Verify employer agent account.

Act No. 2012-491 now requires school boards to include the following clause in all contracts or agreements: ***"By signing this contract, the contracting parties affirm, for the duration of the agreement, that they will not violate federal immigration law or knowingly employ, hire for employment, or continue to employ an unauthorized alien within the state of Alabama. Furthermore, a contracting party found to be in violation of this provision shall be deemed in breach of the agreement and shall be responsible for all damages resulting therefrom."***

The amended law also changed the definition of SUBCONTRACTOR to "A person, business entity, or employer who is awarded a portion of an existing contract by a contractor, regardless of its tier." Another provision states, "Furthermore, during the performance of the contract, the subcontractor shall participate in the E-Verify program and shall verify every employee that is required to be verified according to the applicable federal rules and regulations. This subsection shall only apply to subcontractors performing work on a project subject to the provisions of this section and not to collateral persons or business entities hired by the subcontractor."





STATE OF ALABAMA  
**BUILDING COMMISSION**

770 WASHINGTON AVE  
SUITE 444  
Montgomery, Alabama 36130-1150  
Telephone: (334) 242-4082  
Fax: (334) 242-4182

Robert Bentley  
Governor

Katherine Lynn  
Director

July 17, 2012

**TO: CONTRACTORS, ARCHITECTS AND ENGINEERS**

**FROM: KATHERINE LYNN, DIRECTOR**  
**ALABAMA BUILDING COMMISSION** *Katherine Lynn*

**SUBJECT: MEMORANDUM ON ACT 2009-657 REQUIRING CERTIFICATION OF**  
**FIRE ALARM CONTRACTORS**

Act 2009-657, which was signed by Governor Riley on May 21, 2009, requires fire alarm contractors to be certified by and to obtain a permit from the State Fire Marshal. The act provided a 36-month grace period before requiring full compliance which expires on July 31, 2012.

In accordance with §34-33A-9, the local building official is required to receive a copy of the State Fire Marshal's permit before issuing a license or building permit. **Beginning August 1, 2012, the Building Commission will require the general contractor to furnish a copy of the fire alarm contractor's State Fire Marshal's Permit to the Building Commission Inspector at the Pre-Construction Conference.**

Beginning August 1, 2012, and pursuant to §34-33A-11(b), the Building Commission will require architects and engineers to obtain a copy of the fire alarm contractor's State Fire Marshal's Permit when the general contractor submits the list of subcontractors for the contract. The architect or engineer shall reject fire alarm contractors that cannot provide a copy of the required State Fire Marshal's Permit.

If you have any questions, please feel free to contact me at (334) 242-4082 or the State Fire Marshal, Ed Paulk, at (334) 241-4166.

cc: Mr. Ed Paulk, State Fire Marshal  
Mr. Perry Taylor, State School Architect



ROBERT BENTLEY  
GOVERNOR

**STATE OF ALABAMA  
DEPARTMENT OF INSURANCE**

State Fire Marshal's Office  
201 Monroe Street, Suite 1790  
Post Office Box 303352  
Montgomery, Alabama 36130-3352  
Telephone: (334) 241-4166  
Facsimile: (334) 241-4158  
Internet: [www.firemarshal.alabama.gov](http://www.firemarshal.alabama.gov)

JIM L. RIDLING  
COMMISSIONER

EDWARD S. PAULK  
STATE FIRE MARSHAL

**MAILING ADDRESS:**

P.O. BOX 303352  
MONTGOMERY, AL 36130-3352

**OVERNIGHT ADDRESS:**

201 MONROE STREET, SUITE 1790  
MONTGOMERY, AL 36104  
**PLEASE USE FEDEX, UPS OR DHL**

**APPLICATION FOR STATE FIRE MARSHAL'S CERTIFIED FIRE ALARM CONTRACTOR PERMIT**

**PLEASE PRINT OR TYPE**

In compliance with Sections 34-33A-1 to 34-33A-13, Code of Alabama, 1975, I hereby apply for a State Fire Marshal's Permit to engage in the installation, repair, alteration, maintenance, or inspection of fire alarm systems in Alabama.

CERTIFICATE HOLDER'S NAME: \_\_\_\_\_

CERTIFICATE HOLDERS SSN: \_\_\_\_\_ DOB: \_\_\_\_\_

NAME OF BUSINESS: \_\_\_\_\_

BUSINESS OWNER NAME: \_\_\_\_\_

BUSINESS OWNER SSN: \_\_\_\_\_ DOB: \_\_\_\_\_ ARE YOU A U.S. CITIZEN? YES NO

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

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

BUSINESS TELEPHONE: \_\_\_\_\_ PERMIT TYPE: INITIAL ☐ RENEWAL ☐  
Current Permit # \_\_\_\_\_

This is to certify that \_\_\_\_\_ (certificate holder) is presently employed by \_\_\_\_\_ (business) in the capacity of \_\_\_\_\_ (title) and is authorized to act for the business in all matters pertaining to the installation, repair, alteration, addition, maintenance, or inspection of fire alarm systems in the state of Alabama.

If for any reason the certificate holder terminates employment with the above business, we the undersigned, do understand that the State Fire Marshal's Office is to be notified within thirty (30) days, and that the business will have nine (9) months or until expiration of the current permit, whichever comes first, to submit an application on a new certificate holder and be issued a new permit.

I the undersigned do certify that the information provided above is true and correct. I the undersigned do understand that submission of false information is grounds for license revocation and may subject me to criminal penalties.

Owner/President Signature \_\_\_\_\_ Date \_\_\_\_\_ Certificate Holder Signature \_\_\_\_\_ Date \_\_\_\_\_

INITIAL/RENEWAL FEE \$100.00

INCLUDE FEE WHEN SUBMITTING APPLICATION. (CHECK OR MONEY ORDER MADE PAYABLE TO THE STATE FIRE MARSHAL'S FUND.)

INCLUDE COPY OF NICET CERTIFICATION CARD (CURRENT) FOR FIRE ALARM SYSTEM TECHNICIAN - LEVEL III.

## **CERTIFIED FIRE ALARM CONTRACTOR ATTACHMENT**

1. Home address of the NICET Certificate holder:

\_\_\_\_\_  
Street Address

\_\_\_\_\_  
City State Zip Code

\_\_\_\_\_  
Phone Number (this is the number you can be reached at)

2. Are you a United States Citizen? \_\_\_\_ YES \_\_\_\_ NO
3. I understand as the NICET Certificate holder for this company that I am licensed only by this company and no other company within the Fire Alarm Industry.
4. I understand as the NICET Certificate holder for this company that I am responsible for the layout, installation, maintenance, repair or alterations performed by this company.

\_\_\_\_\_  
Signature of NICET Certificate holder

\_\_\_\_\_  
Date

# PERFORMANCE BOND

USE BLACK INK ONLY

SURETY'S BOND NUMBER

Numbers in margin correspond to "Checklist", ABC Form B-7

- (1)
- (2) The **PRINCIPAL** (*Name and address of Contractor as appear in the Construction Contract*)
- (3) The **SURETY** (*Name and Principal Place of Business*)
- (4) The **OWNER** (*Name and address, same as appears in the Construction Contract*)
- (5) The **PENAL SUM** of this Bond (the Contract Sum)  
Dollars (\$) ).
- (6) **DATE** of the Construction Contract :
- (7) The **PROJECT**: (*Same as appears in the Construction Contract*)

1. **WE, THE PRINCIPAL (hereinafter "Contractor") AND THE SURETY**, jointly and severally, hereby bind ourselves, our heirs, executors, administrators, successors, and assigns to the Owner in the Penal Sum stated above for the performance of the Contract, and Contract Change Orders, in accord with the requirements of the Contract Documents, which are incorporated herein by reference. If the Contractor performs the Contract, and Contract Change Orders, in accordance with the Contract Documents, then this obligation shall be null and void; otherwise it shall remain in full force and effect.
2. The Penal Sum shall remain equal to the Contract Sum as the Contract Sum is adjusted by Contract Change Orders. All Contract Change Orders involving an increase in the Contract Sum will require consent of Surety by endorsement of the Contract Change Order form. The Surety waives notification of any Contract Change Orders involving only extension of the Contract Time.

3. Whenever the Architect gives the Contractor and the Surety, at their addresses stated above, a written Notice to Cure a condition for which the Contract may be terminated in accordance with the Contract Documents, the Surety may, within the time stated in the notice, cure or provide the Architect with written verification that satisfactory positive action is in process to cure the condition.
4. The Surety's obligation under this Bond becomes effective after the Contractor fails to satisfy a Notice to Cure and the Owner:
  - (a) gives the Contractor and the Surety, at their addresses stated above, a written Notice of Termination declaring the Contractor to be in default under the Contract and stating that the Contractor's right to complete the Work, or a designated portion of the Work, shall terminate seven days after the Contractor's receipt of the notice; and
  - (b) gives the Surety a written demand that, upon the effective date of the Notice of Termination, the Surety promptly fulfill its obligation under this Bond.
5. In the presence of the conditions described in Paragraph 4, the Surety shall, at its expense:
  - (a) On the effective date of the Notice of Termination, take charge of the Work and be responsible for the safety, security, and protection of the Work, including materials and equipment stored on and off the Project site, and
  - (b) Within twenty-one days after the effective date of the Notice of Termination, proceed, or provide the Owner with written verification that satisfactory positive action is in process to facilitate proceeding promptly, to complete the Work in accordance with the Contract Documents, either with the Surety's resources or through a contract between the Surety and a qualified contractor to whom the Owner has no reasonable objection.
6. As conditions precedent to taking charge of and completing the Work pursuant to Paragraph 5, the Surety shall neither require, nor be entitled to, any agreements or conditions other than those of this Bond and the Contract Documents. In taking charge of and completing the Work, the Surety shall assume all rights and obligations of the Contractor under the Contract Documents; however, the Surety shall also have the right to assert "Surety Claims" to the Owner in accordance with the Contract Documents. The presence or possibility of a Surety Claim shall not be just cause for the Surety to fail or refuse to promptly take charge of and complete the Work or for the Owner to fail or refuse to continue to make payments in accordance with the Contract Documents.
7. By accepting this Bond as a condition of executing the Construction Contract, and by taking the actions described in Paragraph 4, the Owner agrees that:
  - (a) the Owner shall promptly advise the Surety of the unpaid balance of the Contract Sum and, upon request, shall make available or furnish to the Surety, at the cost of reproduction, any portions of the Project Record, and
  - (b) as the Surety completes the Work, or has it completed by a qualified contractor, the Owner shall pay the Surety, in accordance with terms of payment of the Contract Documents, the unpaid balance of the Contract Sum, less any amounts that may be or become due the Owner from the Contractor under the Construction Contract or from the Contractor or the Surety under this Bond.
8. In the presence of the conditions described in Paragraph 4, the Surety's obligation includes responsibility for the correction of Defective Work, liquidated damages, and reimbursement of any reasonable expenses incurred by the Owner as a result of the Contractor's default under the Contract, including architectural, engineering, administrative, and legal services.

Numbers in margin correspond to "Checklist", ABC Form B-7

9. Nothing contained in this Bond shall be construed to mean that the Surety shall be liable to the Owner for an amount exceeding the Penal Sum of this Bond, except in the event that the Surety should be in default under the Bond by failing or refusing to take charge of and complete the Work pursuant to Paragraph 5. If the Surety should fail or refuse to take charge of and complete the Work, the Owner shall have the authority to take charge of and complete the Work, or have it completed, and the following costs to the Owner, less the unpaid balance of the Contract Sum, shall be recoverable under this Bond:

- (a) the cost of completing the Contractor's responsibilities under the Contract, including correction of Defective Work;
- (b) additional architectural, engineering, managerial, and administrative services, and reasonable attorneys' fees incident to completing the Work;
- (c) interest on, and the cost of obtaining, funds to supplement the unpaid balance of the Contract Sum as may be necessary to cover the foregoing costs;
- (d) the fair market value of any reductions in the scope of the Work necessitated by insufficiency of the unpaid balance of the Contract Sum and available supplemental funds to cover the foregoing costs; and
- (f) additional architectural, engineering, managerial, and administrative services, and reasonable attorneys' fees incident to ascertaining and collecting the Owner's losses under the Bond.

10. All claims and disputes arising out of or related to this bond, or its breach, shall be resolved in accordance with Article 24, General Conditions of the Contract.

(8) **SIGNED AND SEALED** this \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_.

(9) **ATTEST:** **CONTRACTOR as PRINCIPAL:**

\_\_\_\_\_

\_\_\_\_\_

By \_\_\_\_\_

\_\_\_\_\_  
Name and Title

(10) Countersigned by  
Alabama Resident Agent for Surety:

**SURETY:**

By \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_  
Name

By \_\_\_\_\_

\_\_\_\_\_  
Address

\_\_\_\_\_  
Name and Title

(11) **NOTE:** Power of attorney for the Surety's signatory shall be furnished with the original and five copies of the bond.

Numbers in margin correspond to "Checklist", ABC Form B-7

# PAYMENT BOND

USE BLACK INK ONLY

SURETY'S BOND NUMBER

- (1)
- (2) The **PRINCIPAL** (Name and address of Contractor, same as appears in the Construction Contract)
- (3) The **SURETY** (Name and Principal Place of Business)
- (4) The **OWNER(s)** (Name and address, same as appears in the Construction Contract)
- (5) The **PENAL SUM** of this Bond (the Contract Sum) Dollars (\$) ).
- (6) **DATE** of the Construction Contract :
- (7) The **PROJECT**: (Same as appears in the Construction Contract)

1. **WE, THE PRINCIPAL (hereinafter "Contractor") AND THE SURETY**, jointly and severally, hereby bind ourselves, our heirs, executors, administrators, successors, and assigns to the Owner in the Penal Sum stated above to promptly pay all persons supplying labor, materials, or supplies for or in the prosecution of the Contract, which is incorporated herein by reference, and any modifications thereof by Contract Change Orders. If the Contractor and its Subcontractors promptly pay all persons supplying labor, materials, or supplies for or in the prosecution of the Contract and Contract Change Orders, then this obligation shall be null and void; otherwise to remain and be in full force and effect.
2. The Penal Sum shall remain equal to the Contract Sum as the Contract Sum is adjusted by Contract Change Orders. All Contract Change Orders involving an increase in the Contract Sum will require consent of Surety by endorsement of the Contract Change Order form. The Surety waives notification of any Contract Change Orders involving only extension of the Contract Time.

Numbers in margin correspond to "Checklist", ABC Form B-7

3. Any person that has furnished labor, materials, or supplies for or in the prosecution of the Contract and Contract Change Orders for which payment has not been timely made may institute a civil action upon this Bond and have their rights and claims adjudicated in a civil action and judgment entered thereon. Notwithstanding the foregoing, a civil action may not be instituted on this bond until 45 days after written notice to the Surety of the amount claimed to be due and the nature of the claim. The civil action must commence not later than one year from the date of final settlement of the Contract. The giving of notice by registered or certified mail, postage prepaid, addressed to the Surety at any of its places of business or offices shall be deemed sufficient. In the event the Surety or Contractor fails to pay the claim in full within 45 days from the mailing of the notice, then the person or persons may recover from the Contractor and Surety, in addition to the amount of the claim, a reasonable attorney's fee based on the result, together with interest on the claim from the date of the notice.
4. Every person having a right of action on this bond shall, upon written application to the Owner indicating that labor, material, or supplies for the Work have been supplied and that payment has not been made, be promptly furnished a certified copy of this bond and the Construction Contract. The claimant may bring a civil action in the claimant's name on this Bond against the Contractor and the Surety, or either of them, in the county in which the Work is to be or has been performed or in any other county where venue is otherwise allowed by law.
5. This bond is furnished to comply with Code of Alabama, §39-1-1, and all provisions thereof shall be applicable to civil actions upon this bond.
6. All claims and disputes between Owner and either the Contractor or Surety arising out of or related to this bond, or its breach, shall be resolved in accordance with Article 24, General Conditions of the Contract

(8) **SIGNED AND SEALED** this \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_.

(9) ATTEST: **CONTRACTOR as PRINCIPAL:**

\_\_\_\_\_  
By \_\_\_\_\_  
\_\_\_\_\_  
Name and Title

(10) Countersigned by  
Alabama Resident Agent for Surety: **SURETY:**

By \_\_\_\_\_  
\_\_\_\_\_  
Name  
\_\_\_\_\_  
Address  
By \_\_\_\_\_  
\_\_\_\_\_  
Name and Title

(11) NOTE: Power of attorney for the Surety's signatory shall be furnished with the original and five copies of the bond.



# GENERAL CONDITIONS of the CONTRACT

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## ARTICLE 1 DEFINITIONS

Whenever the following terms, or pronouns in place of them, are used in the Contract Documents, the intent and meaning shall be interpreted as follows:

- A. ALABAMA BUILDING COMMISSION:** The Technical Staff of the Alabama Building Commission.
- B. ARCHITECT:** The Architect is the person or entity lawfully licensed to practice architecture in the State of Alabama, who is under contract with the Owner as the primary design professional for the Project and identified as the Architect in the Construction Contract. The term "Architect" means the Architect or the Architect's authorized representative. If the employment of the Architect is terminated, the Owner shall employ a new Architect whose status under the Contract Documents shall be that of the former Architect. If the primary design professional for the Project is a Professional Engineer, the term "Engineer" shall be substituted for the term "Architect" wherever it appears in this document.
- C. BC PROJECT INSPECTOR:** The member of the Technical Staff of the Alabama Building

Commission to whom the Project is assigned relative to executing the respective inspections and authorities described in Article 16, Inspection of the Work.

- D. COMMISSION:** The Alabama Building Commission, or any agency that may be designated by the Legislature as its successor.
- E. CONTRACT:** The Contract is the embodiment of the Contract Documents. The Contract represents the entire and integrated agreement between the Owner and Contractor and supersedes any prior written or oral negotiations, representations or agreements that are not incorporated into the Contract Documents. The Contract may be amended only by a Contract Change Order or a Modification to the Construction Contract. The contractual relationship which the Contract creates between the Owner and the Contractor extends to no other persons or entities. The Contract consists of the following Contract Documents, including all additions, deletions, and modifications incorporated therein before the execution of the Construction Contract:
- (1) Construction Contract
  - (2) Performance and Payment Bonds
  - (3) Conditions of the Contract (General, Supplemental, and other Conditions)
  - (4) Specifications
  - (5) Drawings
  - (6) Contract Change Orders
  - (7) Modifications to the Construction Contract (applicable to PSCA Projects)
- F. CONTRACT SUM:** The Contract Sum is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents. The term “Contract Sum” means the Contract Sum stated in the Construction Contract as may have been increased or decreased by Change Order(s) in accordance with the Contract Documents.
- G. CONTRACT TIME:** The Contract Time is the period of time in which the Contractor must achieve Substantial Completion of the Work. The date on which the Contract Time begins is specified in the written Notice To Proceed issued to the Contractor by the Owner or Director. The Date of Substantial Completion is the date established in accordance with Article 32. The term “Contract Time” means the Contract Time stated in the Construction Contract as may have been extended by Change Order(s) in accordance with the Contract Documents. The term “day” as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.
- H. CONTRACTOR:** The Contractor is the person or persons, firm, partnership, joint venture, association, corporation, cooperative, limited liability company, or other legal entity, identified as such in the Construction Contract. The term “Contractor” means the Contractor or the Contractor’s authorized representative.
- I. DEFECTIVE WORK:** The term “Defective Work” shall apply to: (1) any product, material, system, equipment, or service, or its installation or performance, which does not conform to the requirements of the Contract Documents, (2) in-progress or completed Work the workmanship of which does not conform to the quality specified or, if not specified, to the quality produced by skilled workers performing work of a similar nature on similar projects in the state, (3) substitutions and deviations not properly submitted and approved or otherwise authorized, (4) temporary supports, structures, or construction which will not produce the results required by the Contract Documents, and (5) materials or equipment rendered unsuitable for incorporation into the Work due

to improper storage or protection.

- J. DIRECTOR:** The Director of the Technical Staff of the Alabama Building Commission.
- K. DRAWINGS:** The Drawings are the portions of the Contract Documents showing graphically the design, location, layout, and dimensions of the Work, in the form of plans, elevations, sections, details, schedules, and diagrams.
- L. NOTICE TO PROCEED:** A proceed order issued by the Owner or Director, as applicable, fixing the date on which the Contractor shall begin the prosecution of the Work, which is also the date on which the Contract Time shall begin.
- M. OWNER:** The Owner is the entity or entities identified as such in the Construction Contract and is referred to throughout the Contract Documents as if singular in number. The term "Owner" means the Owner or the Owner's authorized representative. The term "Owner" as used herein shall be synonymous with the term "Awarding Authority" as defined and used in Title 39 - Public Works, Code of Alabama, 1975, as amended.
- N. THE PROJECT:** The Project is the total construction of which the Work required by these Contract Documents may be the entirety or only a part with other portions to be constructed by the Owner or separate contractors.
- O. PROJECT MANUAL:** The Project Manual is the volume usually assembled for the Work which may include the Advertisement for Bids, Instructions to Bidders, sample forms, General Conditions of the Contract, Supplementary Conditions, and Specifications of the Work.
- P. SPECIFICATIONS:** The Specifications are that portion of the Contract Documents which set forth in writing the standards of quality and performance of products, equipment, materials, systems, and services and workmanship required for acceptable performance of the Work.
- Q. SUBCONTRACTOR:** A Subcontractor is a person or entity who is undertaking the performance of any part of the Work by virtue of a contract with the Contractor. The term "Subcontractor" means a Subcontractor or its authorized representatives.
- R. THE WORK:** The Work is the construction and services required by the Contract Documents and includes all labor, materials, supplies, equipment, and other items and services as are necessary to produce the required construction and to fulfill the Contractor's obligations under the Contract. The Work may constitute the entire Project or only a portion of it.

## **ARTICLE 2**

### **INTENT and INTERPRETATION of the CONTRACT DOCUMENTS**

#### **A. INTENT**

It is the intent of the Contract Documents that the Contractor shall properly execute and complete the Work described by the Contract Documents, and unless otherwise provided in the Contract, the Contractor shall provide all labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services, whether temporary

or permanent and whether or not incorporated or to be incorporated in the Work, in full accordance with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.

**B. COMPLEMENTARY DOCUMENTS**

The Contract Documents are complementary. If Work is required by one Contract Document, the Contractor shall perform the Work as if it were required by all of the Contract Documents. However, the Contractor shall be required to perform Work only to the extent that is consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.

**C. ORDER of PRECEDENCE**

Should any discrepancy arise between the various elements of the Contract Documents, precedence shall be given to them in the following order unless to do so would contravene the apparent Intent of the Contract Documents stated in preceding Paragraph A:

- (1) The Construction Contract.
- (2) Addenda, with those of later date having precedence over those of earlier date.
- (3) Supplementary Conditions (or other Conditions which modify the General Conditions of the Contract).
- (4) General Conditions of the Contract.
- (5) The Specifications.
- (6) Details appearing on the Drawings; large scale details shall take precedence over smaller scale details.
- (7) The Drawings; large scale drawings shall take precedence over smaller scale drawings.

**D. ORGANIZATION**

Except as may be specifically stated within the technical specifications, neither the organization of the Specifications into divisions, sections, or otherwise, nor any arrangement of the Drawings shall control how the Contractor subcontracts portions of the Work or assigns Work to any trade.

**E. INTERPRETATION**

(1) The Contract Documents shall be interpreted collectively, each part complementing the others and consistent with the Intent of the Contract Documents stated in preceding Paragraph A. Unless an item shown or described in the Contract Documents is specifically identified to be furnished or installed by the Owner or others or is identified as "Not In Contract" ("N.I.C."), the Contractor's obligation relative to that item shall be interpreted to include furnishing, assembling, installing, finishing, and/or connecting the item at the Contractor's expense to produce a product or system that is complete, appropriately tested, and in operative condition ready for use or subsequent construction or operation of the Owner or separate contractors. The omission of words or phrases for brevity of the Contract Documents, the inadvertent omission of words or phrases, or obvious typographical or written errors shall not defeat such interpretation as long as it is reasonably inferable from the Contract Documents as a whole.

(2) Words or phrases used in the Contract Documents which have well-known technical or construction industry meanings are to be interpreted consistent with such recognized meanings

unless otherwise indicated.

(3) Except as noted otherwise, references to standard specifications or publications of associations, bureaus, or organizations shall mean the latest edition of the referenced standard specification or publication as of the date of the Advertisement for Bids.

(4) In the case of inconsistency between Drawings and Specifications or within either document not clarified by addendum, the better quality or greater quantity of Work shall be provided in accordance with the Architect's interpretation.

(5) Generally, portions of the Contract Documents written in longhand take precedence over typed portions, and typed portions take precedence over printed portions.

(6) Any doubt as to the meaning of the Contract Documents or any obscurity as to the wording of them, shall be promptly submitted in writing to the Architect for written interpretation, explanation, or clarification.

**F. SEVERABILITY**

The partial or complete invalidity of any one or more provision of this Contract shall not affect the validity or continuing force and effect of any other provision.

**ARTICLE 3**  
**CONTRACTOR'S REPRESENTATIONS**

By executing the Construction Contract the Contractor represents to the Owner:

- A. The Contractor has visited the site of the Work to become familiar with local conditions under which the Work is to be performed and to evaluate reasonably observable conditions as compared with requirements of the Contract Documents.
- B. The Contractor shall use its best skill and attention to perform the Work in an expeditious manner consistent with the Contract Documents.
- C. The Contractor is an independent contractor and in performance of the Contract remains and shall act as an independent contractor having no authority to represent or obligate the Owner in any manner unless authorized by the Owner in writing.

**ARTICLE 4**  
**DOCUMENTS FURNISHED to CONTRACTOR**

Unless otherwise provided in the Contract Documents, twenty sets of Drawings and Project Manuals will be furnished to the Contractor by the Architect without charge. Other copies requested will be furnished at reproduction cost.

**ARTICLE 5**  
**OWNERSHIP of DRAWINGS**

All original or duplicated Drawings, Specifications, and other documents prepared by the Architect, and furnished to the Contractor are the property of the Architect and are to be used solely for this Project and not to be used in any manner for other work. Upon completion of the Work, all copies of Drawings and Specifications, with the exception of the Contractor's record set, shall be returned or accounted for by the Contractor to the Architect, on request.

## **ARTICLE 6**

### **SUPERVISION, SUPERINTENDENT, and EMPLOYEES**

#### **A. SUPERVISION and CONSTRUCTION METHODS**

(1) The term "Construction Methods" means the construction means, methods, techniques, sequences, and procedures utilized by the Contractor in performing the Work. The Contractor is solely responsible for supervising and coordinating the performance of the Work, including the selection of Construction Methods, unless the Contract Documents give other specific instructions concerning these matters.

(2) The Contractor is solely and completely responsible for job site safety, including the protection of persons and property in accordance with Article 14.

(3) The Contractor shall be responsible to the Owner for acts and omissions of not only the Contractor and its agents and employees, but all persons and entities, and their agents and employees, who are performing portions of the Work for or on behalf of the Contractor or any of its Subcontractors.

(4) The Contractor shall be responsible to inspect the in-progress and completed Work to verify its compliance with the Contract Documents and to insure that any element or portion of the Work upon which subsequent Work is to be applied or performed is in proper condition to receive the subsequent Work.

#### **B. SUPERINTENDENT**

(1) The Contractor shall employ and maintain a competent level of supervision for the performance of the Work at the Project site, including a superintendent who shall: **(a)** have full authority to receive instructions from the Architect or Owner and to act on those instructions and **(b)** be present at the Project site at all times during which Work is being performed.

(2) Before beginning performance of the Work, the Contractor shall notify the Architect in writing of the name and qualifications of its proposed superintendent so that the Owner may review the individual's qualifications. If, for reasonable cause, the Owner refuses to approve the individual, or withdraws its approval after once giving it, the Contractor shall name a different superintendent for the Owner's review and approval. Any disapproved superintendent will not perform in that capacity thereafter at the Project site.

#### **C. EMPLOYEES**

The Contractor shall permit only fit and skilled persons to perform the Work. The Contractor shall

enforce safety procedures, strict discipline, and good order among persons performing the Work. The Contractor will remove from its employment on the Project any person who deliberately or persistently produces non-conforming Work or who fails or refuses to conform to reasonable rules of personal conduct contained in the Contract Documents or implemented by the Owner and delivered to the Contractor in writing during the course of the Work.

## **ARTICLE 7**

### **REVIEW of CONTRACT DOCUMENTS and FIELD CONDITIONS by CONTRACTOR**

- A. In order to facilitate assembly and installation of the Work in accordance with the Contract Documents, before starting each portion of the Work, the Contractor shall examine and compare the relevant Contract Documents, and compare them to relevant field measurements made by the Contractor and any conditions at the site affecting that portion of the Work.
- B. If the Contractor discovers any errors, omissions, or inconsistencies in the Contract Documents, the Contractor shall promptly report them to the Architect as a written request for information that includes a detailed statement identifying the specific Drawings or Specifications that are in need of clarification and the error, omission, or inconsistency discovered in them.
  - (1) The Contractor shall not be expected to act as a licensed design professional and ascertain whether the Contract Documents comply with applicable laws, statutes, ordinances, building codes, and rules and regulations, but the Contractor shall be obligated to promptly notify the Architect of any such noncompliance discovered by or made known to the Contractor. If the Contractor performs Work without fulfilling this notification obligation, the Contractor shall pay the resulting costs and damages that would have been avoided by such notification.
  - (2) The Contractor shall not be liable to the Owner for errors, omissions, or inconsistencies that may exist in the Contract Documents, or between the Contract Documents and conditions at the site, unless the Contractor knowingly fails to report a discovered error, omission, or inconsistency to the Architect, in which case the Contractor shall pay the resulting costs and damages that would have been avoided by such notification.
- C. If the Contractor considers the Architect's response to a request for information to constitute a change to the Contract Documents involving additional costs and/or time, the Contractor shall follow the procedures of Article 20, Claims for Extra Cost or Extra Work.
- D. If, with undue frequency, the Contractor requests information that is obtainable through reasonable examination and comparison of the Contract Documents, site conditions, and previous correspondence, interpretations, or clarifications, the Contractor shall be liable to the Owner for reasonable charges from the Architect for the additional services required to review, research, and respond to such requests for information.

## **ARTICLE 8**

### **SURVEYS by CONTRACTOR**

- A. The Contractor shall provide competent engineering services to assure accurate execution of the Work in accordance with the Contract Documents. The Contractor shall verify the figures given for

the contours, approaches and locations shown on the Drawings before starting any Work and be responsible for the accuracy of the finished Work. Without extra cost to the Owner, the Contractor shall engage a licensed surveyor if necessary to verify boundary lines, keep within property lines, and shall be responsible for encroachments on rights or property of public or surrounding property owners.

- B.** The Contractor shall establish all base lines for the location of the principal components of the Work and make all detail surveys necessary for construction, including grade stakes, batter boards and other working points, lines and elevations. If the Work involves alteration of or addition to existing structures or improvements, the Contractor shall locate and measure elements of the existing conditions as is necessary to facilitate accurate fabrication, assembly, and installation of new Work in the relationship, alignment, and/or connection to the existing structure or improvement as is shown in the Contract Documents.

## **ARTICLE 9**

### **SUBMITTALS**

- A.** Where required by the Contract Documents, the Contractor shall submit shop drawings, product data, samples and other information (hereinafter referred to as Submittals) to the Architect for the purpose of demonstrating the way by which the Contractor proposes to conform to the requirements of the Contract Documents. Submittals which are not required by the Contract Documents may be returned by the Architect without action.
- B.** The Contractor shall be responsible to the Owner for the accuracy of its Submittals and the conformity of its submitted information to the requirements of the Contract Documents. Each Submittal shall bear the Contractor's approval, evidencing that the Contractor has reviewed and found the information to be in compliance with the requirements of the Contract Documents. Submittals which are not marked as reviewed and approved by the Contractor may be returned by the Architect without action.
- C.** The Contractor shall prepare and deliver its submittals to the Architect sufficiently in advance of construction requirements and in a sequence as to cause no delay in the Work or in the activities of the Owner or of separate contractors. In coordinating the Submittal process with its construction schedule, the Contractor shall allow sufficient time to permit adequate review by the Architect.
- D.** By approving a Submittal the Contractor represents not only that the element of Work presented in the Submittal complies with the requirements of the Contract Documents, but also that the Contractor has:
  - (1)** found the layout and/or dimensions in the Submittal to be comparable with those in the Contract Documents and other relevant Submittals and has made field measurements as necessary to verify their accuracy, and
  - (2)** determined that products, materials, systems, equipment and/or procedures presented in the Submittal are compatible with those presented, or being presented, in other relevant Submittals and with the Contractor's intended Construction Methods.
- E.** The Contractor shall not fabricate or perform any portion of the Work for which the Contract Documents require Submittals until the respective Submittals have been approved by the Architect.



- F. In the case of a resubmission, the Contractor shall direct specific attention to all revisions in a Submittal. The Architect's approval of a resubmission shall not apply to any revisions that were not brought to the Architect's attention.
- G. If the Contract Documents specify that a Submittal is to be prepared and sealed by a registered architect or licensed engineer retained by the Contractor, all drawings, calculations, specifications, and certifications of the Submittal shall bear the Alabama seal of registration and signature of the registered/licensed design professional who prepared them or under whose supervision they were prepared. The Owner and the Architect shall be entitled to rely upon the adequacy, accuracy and completeness of such a Submittal, provided that all performance and design criteria that such Submittal must satisfy are sufficiently specified in the Contract Documents. The Architect will review, approve or take other appropriate action on such a Submittal only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Contractor shall not be responsible for the adequacy of the performance or design criteria specified in the Contract Documents.

#### **H. DEVIATIONS**

- (1) The Architect is authorized by the Owner to approve "minor" deviations from the requirements of the Contract Documents. "Minor" deviations are defined as those which are in the interest of the Owner, do not materially alter the quality or performance of the finished Work, and do not affect the cost or time of performance of the Work. Deviations which are not "minor" may be authorized only by the Owner through the Change Order procedures of Article 19.
- (2) Any deviation from the requirements of the Contract Documents contained in a Submittal shall be clearly identified as a "Deviation from Contract Requirements" (or by similar language) within the Submittal and, in a letter transmitting the Submittal to the Architect, the Contractor shall direct the Architect's attention to, and request specific approval of, the deviation. Otherwise, the Architect's approval of a Submittal does not constitute approval of deviations from the requirements of the Contract Documents contained in the Submittal.
- (3) The Contractor shall bear all costs and expenses of any changes to the Work, changes to work performed by the Owner or separate contractors, or additional services by the Architect required to accommodate an approved deviation unless the Contractor has specifically informed the Architect in writing of the required changes and a Change Order has been issued authorizing the deviation and accounting for such resulting changes and costs.

#### **I. ARCHITECT'S REVIEW and APPROVAL**

- (1) The Architect will review the Contractor's Submittals for conformance with requirements of, and the design concept expressed in, the Contract Documents and will approve or take other appropriate action upon them. This review is not intended to verify the accuracy and completeness of details such as dimensions and quantities nor to substantiate installation instructions or performance of equipment or systems, all of which remain the responsibility of the Contractor. However, the Architect shall advise the Contractor of any errors or omissions which the Architect may detect during this review. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

(2) The Architect will review and respond to all Submittals with reasonable promptness to avoid delay in the Work or in the activities of the Owner, Contractor or separate contractors, while allowing sufficient time to permit adequate review.

(3) No corrections or changes to Submittals indicated by the Architect will be considered as authorizations to perform Extra Work. If the Contractor considers such correction or change of a Submittal to require Work which differs from the requirements of the Contract Documents, the Contractor shall promptly notify the Architect in writing in accordance with Article 20, Claims for Extra Cost or Extra Work.

**J. CONFORMANCE with SUBMITTALS**

The Work shall be constructed in accordance with approved Submittals.

**ARTICLE 10  
DOCUMENTS and SAMPLES at the SITE**

**A. “AS ISSUED” SET**

The Contractor shall maintain at the Project site, in good order, at least one copy of all Addenda, Change Orders, supplemental drawings, written directives and clarifications, and approved Submittals intact as issued, and an updated construction schedule.

**B. “POSTED” SET**

The Contractor shall maintain at the Project site, in good order, at least one set of the Drawings and Project Manual into which the Contractor has “posted”(incorporated) all Addenda, Change Orders, supplemental drawings, clarifications, and other information pertinent to the proper performance of the Work. The Contractor shall assure that all sets of the Drawings and Project Manuals being used by the Contractor, Subcontractors, and suppliers are “posted” with the current information to insure that updated Contract Documents are used for performance of the Work.

**C. RECORD SET**

One set of the Drawings and Project Manual described in Paragraph B shall be the Contractor’s record set in which the Contractor shall record all field changes, corrections, selections, final locations, and other information as will be duplicated on the “As-built” documents required under Article 11. The Contractor shall record such “as-built” information in its record set as it becomes available through progress of the Work. The Contractor’s performance of this requirement shall be subject to confirmation by the Architect at any time as a prerequisite to approval of Progress Payments.

**D.** The documents and samples required by this Article to be maintained at the Project site shall be readily available to the Architect, Owner, BC Project Inspector, and their representatives.

**ARTICLE 11  
“AS-BUILT” DOCUMENTS**

- A. Unless otherwise provided in the Contract Documents, the Contractor shall deliver two (2) sets of “As-built” documents, as described herein, to the Architect for submission to the Owner upon completion of the Work. Each set of “As-built” documents shall consist of a copy of the Drawings and Project Manual, in like-new condition, into which the Contractor has neatly incorporated all Addenda, Change Orders, supplemental drawings, clarifications, field changes, corrections, selections, actual locations of underground utilities, and other information as required herein or specified elsewhere in the Contract Documents.
- B. The Contractor shall use the following methods for incorporating information into the “As-built” documents:
- (1) **Drawings**
- (a) To the greatest extent practicable, information shall be carefully drawn and lettered, in ink, on the Drawings in the form of sketches, details, plans, notes, and dimensions as required to provide a fully dimensioned record of the Work. When required for clarity, sketches, details, or partial plans shall be drawn on supplemental sheets and bound into the Drawings and referenced on the drawing being revised.
- (b) Where a revised drawing has been furnished by the Architect, the drawing of latest date shall be bound into the Drawings in the place of the superseded drawing.
- (c) Where a supplemental drawing has been furnished by the Architect, the supplemental drawing shall be bound into the Drawings in an appropriate location and referred to by notes added to the drawing being supplemented.
- (d) Where the Architect has furnished details, partial plans, or lengthy notes of which it would be impractical for the Contractor to redraw or letter on a drawing, such information may be affixed to the appropriate drawing with transparent tape if space is available on the drawing.
- (e) Any entry of information made in the Drawings that is the result of an Addendum or Change Order, shall identify the Addendum or Change Order from which it originated.
- (2) **Project Manual**
- (a) A copy of all Addenda and Change Orders, excluding drawings thereof, shall be bound in the front of the Project Manual.
- (b) Where a document, form, or entire specification section is revised, the latest issue shall be bound into the Project Manual in the place of the superseded issue.
- (c) Where information within a specification section is revised, the deleted or revised information shall be drawn through in ink and an adjacent note added identifying the Addendum or Change Order containing the revised information.
- C. Within ten days after the Date of Substantial Completion of the Work, or the last completed portion of the Work, the Contractor shall submit the “As-built” documents to the Architect for approval. If the Architect requires that any corrections be made, the documents will be returned in a reasonable time for correction and resubmission.

**ARTICLE 12**  
**PROGRESS SCHEDULE**

(Not applicable if the Contract Time is 60 days or less.)

- A. The Contractor shall within fifteen days after the date of commencement stated in the Notice to Proceed, or such other time as may be provided in the Contract Documents, prepare and submit to

the Architect for review and approval a practicable construction schedule informing the Architect and Owner of the order in which the Contractor plans to carry on the Work within the Contract Time. The Architect's review and approval of the Contractor's construction schedule shall be only for compliance with the specified format, Contract Time, and suitability for monitoring progress of the Work and shall not be construed as a representation that the Architect has analyzed the schedule to form opinions of sequences or durations of time represented in the schedule.

- B. If a schedule format is not specified elsewhere in the Contract Documents, the construction schedule shall be prepared using ABC' Form C-11, "Progress Schedule and Report", (contained in the Project Manual) or similar format of suitable scale and detail to indicate the percentage of Work scheduled to be completed at the end of each month. At the end of each month the Contractor shall enter the actual percentage of completion on the construction schedule submit two copies to the Architect, and attach one copy to each copy of the monthly Application for Payment. The construction schedule shall be revised to reflect any agreed extensions of the Contract Time or as required by conditions of the Work.
- C. If a more comprehensive schedule format is specified elsewhere in the Contract Documents or voluntarily employed by the Contractor, ABC Form C-11 shall also be prepared, updated, and submitted as described in preceding Paragraph B.
- D. The Contractor's construction schedule shall be used by the Contractor, Architect, and Owner to determine the adequacy of the Contractor's progress. The Contractor shall be responsible for maintaining progress in accordance with the currently approved construction schedule and shall increase the number of shifts, and/or overtime operations, days of work, and/or the amount of construction plant and equipment as may be necessary to do so. If the Contractor's progress falls materially behind the currently approved construction schedule and, in the opinion of the Architect or Owner, the Contractor is not taking sufficient steps to regain schedule, the Architect may, with the Owner's concurrence, issue the Contractor a Notice to Cure pursuant to Article 27. In such a Notice to Cure the Architect may require the Contractor to submit such supplementary or revised construction schedules as may be deemed necessary to demonstrate the manner in which schedule will be regained.

### **ARTICLE 13**

#### **EQUIPMENT, MATERIALS, and SUBSTITUTIONS**

- A. Every part of the Work shall be executed in a workmanlike manner in accordance with the Contract Documents and approved Submittals. All materials used in the Work shall be furnished in sufficient quantities to facilitate the proper and expeditious execution of the Work and shall be new except such materials as may be expressly provided or allowed in the Contract Documents to be otherwise.
- B. Whenever a product, material, system, item of equipment, or service is identified in the Contract Documents by reference to a trade name, manufacturer's name, model number, etc.(hereinafter referred to as "source"), and only one or two sources are listed, or three or more sources are listed and followed by "or approved equal" or similar wording, it is intended to establish a required standard of performance, design, and quality, and the Contractor may submit, for the Architect's approval, products, materials, systems, equipment, or services of other sources which the Contractor can prove to the Architect's satisfaction are equal to, or exceed, the standard of

performance, design and quality specified, unless the provisions of Paragraph D below apply. Such proposed substitutions are not to be purchased or installed without the Architect's written approval of the substitution.

- C. If the Contract Documents identify three or more sources for a product, material, system, item of equipment or service to be used and the list of sources is not followed by "or approved equal" or similar wording, the Contractor may make substitution only after evaluation by the Architect and execution of an appropriate Contract Change Order.
- D. If the Contract Documents identify only one source and expressly provide that it is an approved sole source for the product, material, system, item of equipment, or service, the Contractor must furnish the identified sole source.

#### **ARTICLE 14**

#### **SAFETY and PROTECTION of PERSONS and PROPERTY**

- A. The Contractor shall be solely and completely responsible for conditions at the Project site, including safety of all persons (including employees) and property. The Contractor shall create, maintain, and supervise conditions and programs to facilitate and promote safe execution of the Work, and shall supervise the Work with the attention and skill required to assure its safe performance. Safety provisions shall conform to OSHA requirements and all other federal, state, county, and local laws, ordinances, codes, and regulations. Where any of these are in conflict, the more stringent requirement shall be followed. Nothing contained in this Contract shall be construed to mean that the Owner has employed the Architect nor has the Architect employed its consultants to administer, supervise, inspect, or take action regarding safety programs or conditions at the Project site.
- B. The Contractor shall employ Construction Methods, safety precautions, and protective measures that will reasonably prevent damage, injury or loss to:
  - (1) workers and other persons on the Project site and in adjacent and other areas that may be affected by the Contractor's operations;
  - (2) the Work and materials and equipment to be incorporated into the Work and stored by the Contractor on or off the Project site; and
  - (3) other property on, or adjacent to, the Project site, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities, and other improvements not designated in the Contract Documents to be removed, relocated, or replaced.
- C. The Contractor shall be responsible for the prompt remedy of damage and loss to property, including the filing of appropriate insurance claims, caused in whole or in part by the fault or negligence of the Contractor, a Subcontractor, or anyone for whose acts they may be liable.
- D. The Contractor shall comply with and give notices required by applicable laws, ordinances, rules, regulations and lawful orders of public authorities bearing on safety and protection of persons or property, including without limitation notices to adjoining property owners of excavation or other construction activities that potentially could cause damage or injury to adjoining property or persons thereon.

- E. The Contractor shall erect and maintain barriers, danger signs, and any other reasonable safeguards and warnings against hazards as may be required for safety and protection during performance of the Contract and shall notify owners and users of adjacent sites and utilities of conditions that may exist or arise which may jeopardize their safety.
- F. If use or storage of explosives or other hazardous materials or equipment or unusual Construction Methods are necessary for execution of the Work, the Contractor shall exercise commensurate care and employ supervisors and workers properly qualified to perform such activity.
- G. The Contractor shall furnish a qualified safety representative at the Project site whose duties shall include the prevention of accidents. The safety representative shall be the Contractor's superintendent, unless the Contractor assigns this duty to another responsible member of its on-site staff and notifies the Owner and Architect in writing of such assignment.
- H. The Contractor shall not permit a load to be applied, or forces introduced, to any part of the construction or site that may cause damage to the construction or site or endanger safety of the construction, site, or persons on or near the site.
- I. The Contractor shall have the right to act as it deems appropriate in emergency situations jeopardizing life or property. The Contractor shall be entitled to equitable adjustment of the Contract Sum or Contract Time for its efforts expended for the sole benefit of the Owner in an emergency. Such adjustment shall be determined as provided in Articles 19 and 20.
- J. The duty of the Architect and the Architect's consultants to visit the Project site to conduct periodic inspections of the Work or for other purposes shall not give rise to a duty to review or approve the adequacy of the Contractor's safety program, safety supervisor, or any safety measure which Contractor takes or fails to take in, on, or near the Project site.

## **ARTICLE 15**

### **HAZARDOUS MATERIALS**

- A. A Hazardous Material is any substance or material identified as hazardous under any federal, state, or local law or regulation, or any other substance or material which may be considered hazardous or otherwise subject to statutory or regulatory requirements governing its handling, disposal, and/or clean-up. Existing Hazardous Materials are Hazardous Materials discovered at the Project site and not introduced to the Project site by the Contractor, a Subcontractor, or anyone for whose acts they may be liable.
- B. If, during the performance of the Work, the Contractor encounters a suspected Existing Hazardous Material, the Contractor shall immediately stop work in the affected area, take measures appropriate to the condition to keep people away from the suspected Existing Hazardous Material, and immediately notify the Architect and Owner of the condition in writing.
- C. The Owner shall obtain the services of an independent laboratory or professional consultant, appropriately licensed and qualified, to determine whether the suspected material is a Hazardous Material requiring abatement and, if so, to certify after its abatement that it has been rendered harmless. Any abatement of Existing Hazardous Materials will be the responsibility of the Owner. The Owner will advise the Contractor in writing of the persons or entities who will determine the

nature of the suspected material and those who will, if necessary, perform the abatement. The Owner will not employ persons or entities to perform these services to whom the Contractor or Architect has reasonable objection.

- D. After certification by the Owner's independent laboratory or professional consultant that the material is harmless or has been rendered harmless, work in the affected area shall resume upon written agreement between the Owner and Contractor. If the material is found to be an Existing Hazardous Material and the Contractor incurs additional cost or delay due to the presence and abatement of the material, the Contract Sum and/or Contract Time shall be appropriately adjusted by a Contract Change Order pursuant to Article 19.
- E. The Owner shall not be responsible for Hazardous Materials introduced to the Project site by the Contractor, a Subcontractor, or anyone for whose acts they may be liable unless such Hazardous Materials were required by the Contract Documents.

## **ARTICLE 16**

### **INSPECTION of the WORK**

#### **A. GENERAL**

(1) The Contractor is solely responsible for the Work's compliance with the Contract Documents; therefore, the Contractor shall be responsible to inspect in-progress and completed Work, and shall verify its compliance with the Contract Documents and that any element or portion of the Work upon which subsequent Work is to be applied or performed is in proper condition to receive the subsequent Work. Neither the presence nor absence of inspections by the Architect, Owner, Director, BC Project Inspector, any public authority having jurisdiction, or their representatives shall relieve the Contractor of responsibility to inspect the Work, for responsibility for Construction Methods and safety precautions and programs in connection with the Work, or from any other requirement of the Contract Documents.

(2) The Architect, Owner, Director, BC Project Inspector, any public authority having jurisdiction, and their representatives shall have access at all times to the Work for inspection whenever it is in preparation or progress, and the Contractor shall provide proper facilities for such access and inspection. All materials, workmanship, processes of manufacture, and methods of construction, if not otherwise stipulated in the Contract Documents, shall be subject to inspection, examination, and test at any and all places where such manufacture and/or construction are being carried on. Such inspections will not unreasonably interfere with the Contractor's operations.

(3) The Architect will inspect the Work as a representative of the Owner. The Architect's inspections may be supplemented by inspections by the BC Project Inspector as a representative of the Alabama Building Commission.

(4) The Contractor may be charged by the Owner for any extra cost of inspection incurred by the Owner or Architect on account of material and workmanship not being ready at the time of inspection set by the Contractor.

#### **B. TYPES of INSPECTIONS**

**(1) SCHEDULED INSPECTIONS and CONFERENCES.** Scheduled Inspections and Conferences are conducted by the Architect, scheduled by the Architect in coordination with the Contractor and BC Project Inspector, and are attended by the Contractor and applicable Subcontractors, suppliers and manufacturers, and the BC Project Inspector. Scheduled Inspections and Conferences of this Contract include:

**(a) Pre-construction Conference.**

**(b) Pre-roofing Conference** (not applicable if the Contract involves no roofing work)

**(c) Above Ceiling Inspection(s):** An above ceiling inspection of all spaces in the building is required before the ceiling material is installed. Above ceiling inspections are to be conducted at a time when all above ceiling systems are complete and tested to the greatest extent reasonable pending installation of the ceiling material. System identifications and markings are to be complete. All fire-rated construction including fire-stopping of penetrations and specified identification above the ceiling shall be complete. Ceiling framing and suspension systems shall be complete with lights, grilles and diffusers, access panels, fire protection drops for sprinkler heads, etc., installed in their final locations to the greatest extent reasonable. Above ceiling framing to support ceiling mounted equipment shall be complete. The above ceiling construction shall be complete to the extent that after the inspection the ceiling material can be installed without disturbance.

**(d) Final Inspection(s):** A Final Inspection shall establish that the Work, or a designated portion of the Work, is Substantially Complete in accordance with Article 32 and is accepted by the Architect, Owner, and BC Project Inspector as being ready for the Owner's occupancy or use. At the conclusion of this inspection, items requiring correction or completion ("punch list" items) shall be minimal and require only a short period of time for accomplishment to establish Final Acceptance of the Work. If the Work, or designated portion of the Work, includes the installation, or modification, of a fire alarm system or other life safety systems essential to occupancy, such systems shall have been tested and appropriately certified before the Final Inspection.

**(e) Year-end Inspection(s):** An inspection of the Work, or each separately completed portion thereof, is required near the end of the Contractor's one year warranty period(s). The subsequent delivery of the Architect's report of this inspection will serve as confirmation that the Contractor was notified of Defective Work found within the warranty period in accordance with Article 35.

**(2) PERIODIC INSPECTIONS.** Periodic Inspections are conducted throughout the course of the Work by the Architect, the Architect's consultants, their representatives, and the BC Project Inspector, jointly or independently, with or without advance notice to the Contractor.

**(3) SPECIFIED INSPECTIONS and TESTS.** Specified Inspections and Tests include inspections, tests, demonstrations, and approvals that are either specified in the Contract Documents or required by laws, ordinances, rules, regulations, or orders of public authorities having jurisdiction, to be performed by the Contractor, one of its Subcontractors, or an independent testing laboratory or firm (whether paid for by the Contractor or Owner).

## **C. INSPECTIONS by the ARCHITECT**

**(1)** The Architect is not authorized to revoke, alter, relax, or waive any requirements of the Contract Documents (other than "minor" deviations as defined in Article 9 and "minor" changes as defined in Article 19), to finally approve or accept any portion of the Work or to issue instructions contrary to the Contract Documents without concurrence of the Owner.



- (2) The Architect will visit the site at intervals appropriate to the stage of the Contractor's operations and as otherwise necessary to:
- (a) become generally familiar with the in-progress and completed Work and the quality of the Work,
  - (b) determine whether the Work is progressing in general accordance with the Contractor's schedule and is likely to be completed within the Contract Time,
  - (c) visually compare readily accessible elements of the Work to the requirements of the Contract Documents to determine, in general, if the Contractor's performance of the Work indicates that the Work will conform to the requirements of the Contract Documents when completed,
  - (d) endeavor to guard the Owner against Defective Work,
  - (e) review and address with the Contractor any problems in implementing the requirements of the Contract Documents that the Contractor may have encountered, and
  - (f) keep the Owner fully informed about the Project.
- (3) The Architect shall have the authority to reject Defective Work or require its correction, but shall not be required to make exhaustive investigations or examinations of the in-progress or completed portions of the Work to expose the presence of Defective Work. However, it shall be an obligation of the Architect to report in writing, to the Owner, Contractor, and BC Project Inspector, any Defective Work recognized by the Architect.
- (4) The Architect shall have the authority to require the Contractor to stop work only when, in the Architect's reasonable opinion, such stoppage is necessary to avoid Defective Work. The Architect shall not be liable to the Contractor or Owner for the consequences of any decisions made by the Architect in good faith either to exercise or not to exercise this authority.
- (5) "Inspections by the Architect" includes appropriate inspections by the Architect's consultants as dictated by their respective disciplines of design and the stage of the Contractor's operations.

**D. INSPECTIONS by the BC PROJECT INSPECTOR**

- (1) The BC Project Inspector will:
- (a) participate in scheduled inspections and conferences as practicable,
  - (b) perform periodic inspections of in-progress and completed Work to ensure code compliance of the Project and general conformance of the Work with the Contract Documents, and
  - (c) monitor the Contractor's progress and performance of the Work.
- (2) The BC Project Inspector shall have the authority to:
- (a) reject Work that is not in compliance with the State Building Code adopted by the Commission, unless the Work is in accordance with the Contract Documents in which case the BC Project Inspector will advise the Architect to initiate appropriate corrective action, and
  - (b) notify the Architect, Owner, and Contractor of Defective Work recognized by the BC Project Inspector.
- (3) The BC Project Inspector's periodic inspections will usually be scheduled around key stages of construction based upon information reported by the Architect. As the Architect or Owner

deems appropriate, the BC Project Inspector, as well as other members of the Technical Staff, can be requested to schedule special inspections or meetings to address specific matters. The written findings of BC Project Inspector will be transmitted to the Owner, Contractor, and Architect.

(4) The BC Project Inspector is not authorized to revoke, alter, relax, or waive any requirements of the Contract Documents, to finally approve or accept any portion of the Work or to issue instructions contrary to the Contract Documents without concurrence of the Owner. The Contractor shall not proceed with Work as a result of instructions or findings of the BC Project Inspector which the Contractor considers to be a change to the requirements of the Contract Documents without written authorization of the Owner through the Architect.

**E. UNCOVERING WORK**

(1) If the Contractor covers a portion of the Work before it is examined by the Architect and this is contrary to the Architect's request or specific requirements in the Contract Documents, then, upon written request of the Architect, the Work must be uncovered for the Architect's examination and be replaced at the Contractor's expense without change in the Contract Time.

(2) Without a prior request or specific requirement that Work be examined by the Architect before it is covered, the Architect may request that Work be uncovered for examination and the Contractor shall uncover it. If the Work is in accordance with the Contract Documents, the Contract Sum shall be equitably adjusted under Article 19 to compensate the Contractor for the costs of uncovering and replacement. If the Work is not in accordance with the Contract Documents, uncovering, correction, and replacement shall be at the Contractor's expense unless the condition was caused by the Owner or a separate contractor in which event the Owner shall be responsible for payment of such costs.

**F. SPECIFIED INSPECTIONS and TESTS**

(1) The Contractor shall schedule and coordinate Specified Inspections and Tests to be made at appropriate times so as not to delay the progress of the Work or the work of the Owner or separate contractors. If the Contract Documents require that a Specified Inspection or Test be witnessed or attended by the Architect or Architect's consultant, the Contractor shall give the Architect timely notice of the time and place of the Specified Inspection or Test. If a Specified Inspection or Test reveals that Work is not in compliance with requirements of the Contract Documents, the Contractor shall bear the costs of correction, repeating the Specified Inspection or Test, and any related costs incurred by the Owner, including reasonable charges, if any, by the Architect for additional services. Through appropriate Contract Change Order the Owner shall bear costs of tests, inspections or approvals which become Contract requirements subsequent to the receipt of bids.

(2) If the Architect, Owner, or public authority having jurisdiction determines that inspections, tests, demonstrations, or approvals in addition to Specified Inspections and Tests are required, the Contractor shall, upon written instruction from the Architect, arrange for their performance by an entity acceptable to the Owner, giving timely notice to the architect of the time and place of their performance. Related costs shall be borne by the Owner unless the procedures reveal that Work is not in compliance with requirements of the Contract Documents, in which case the Contractor shall bear the costs of correction, repeating the procedures, and any related costs incurred by the Owner, including reasonable charges, if any, by the Architect for additional services.

(3) Unless otherwise required by the Contract Documents, required certificates of Specified Inspections and Tests shall be secured by the Contractor and promptly delivered to the Architect.

(4) Failure of any materials to pass Specified Inspections and Tests will be sufficient cause for refusal to consider any further samples of the same brand or make of that material for use in the Work.

## **ARTICLE 17**

### **CORRECTION of DEFECTIVE WORK**

- A. The Contractor shall, at the Contractor's expense, promptly correct Defective Work rejected by the Architect or which otherwise becomes known to the Contractor, removing the rejected or nonconforming materials and construction from the project site.
- B. Correction of Defective Work shall be performed in such a timely manner as will avoid delay of completion, use, or occupancy of the Work and the work of the Owner and separate contractors.
- C. The Contractor shall bear all expenses related to the correction of Defective Work, including but not limited to: (1) additional testing and inspections, including repeating Specified Inspections and Tests, (2) reasonable services and expenses of the Architect, and (3) the expense of making good all work of the Contractor, Owner, or separate contractors destroyed or damaged by the correction of Defective Work.

## **ARTICLE 18**

### **DEDUCTIONS for UNCORRECTED WORK**

If the Owner deems it advisable and in the Owner's interest to accept Defective Work, the Owner may allow part or all of such Work to remain in place, provided an equitable deduction from the Contract Sum, acceptable to the Owner, is offered by the Contractor.

## **ARTICLE 19**

### **CHANGES in the WORK**

#### **A. GENERAL**

(1) The Owner may at any time direct the Contractor to make changes in the Work which are within the general scope of the Contract, including changes in the Drawings, Specifications, or other portions of the Contract Documents to add, delete, or otherwise revise portions of the Work. The Architect is authorized by the Owner to direct "minor" changes in the Work by written order to the Contractor. "Minor" changes in the Work are defined as those which are in the interest of the Owner, do not materially alter the quality or performance of the finished Work, and do not affect the cost or time of performance of the Work. Changes in the Work which are not "minor" may be authorized only by the Owner.

- (2) If the Owner directs a change in the Work, the change shall be incorporated into the Contract by a Contract Change Order prepared by the Architect and signed by the Contractor, Owner, and other signatories to the Construction Contract, stating their agreement upon the change or changes in the Work and the adjustments, if any, in the Contract Sum and the Contract Time.
- (3) Subject to compliance with Alabama's Public Works Law, the Owner may, upon agreement by the Contractor, incorporate previously unawarded bid alternates into the Contract.
- (4) In the event of a claim or dispute as to the appropriate adjustment to the Contract Sum or Contract Time due to a directive to make changes in the Work, the Work shall proceed as provided in this article subject to subsequent agreement of the parties or final resolution of the dispute pursuant to Article 24.
- (5) Consent of surety will be obtained for all Contract Change Orders involving an increase in the Contract Sum.
- (6) Changes in the Work shall be performed under applicable provisions of the Contract Documents and the Contractor shall proceed promptly to perform changes in the Work, unless otherwise directed by the Owner through the Architect.

**B. DETERMINATION of ADJUSTMENT of the CONTRACT SUM**

The adjustment of the Contract Sum resulting from a change in the Work shall be determined by one of the following methods, or a combination thereof, as selected by the Owner:

(1) **Lump Sum.** By mutual agreement to a lump sum based on or negotiated from an itemized cost proposal from the Contractor. Additions to the Contract Sum shall include the Contractor's direct costs plus a maximum 15% markup for overhead and profit. Where subcontract work is involved the total mark-up for the Contractor and a Subcontractor shall not exceed 25%. No allowance for overhead and profit shall be figured on a change which involves a net credit to the Owner. For the purposes of this method of determining an adjustment of the Contract Sum, "overhead" shall cover the Contractor's indirect costs of the change, such as the cost of bonds, superintendent and other job office personnel, watchman, job office, job office supplies and expenses, temporary facilities and utilities, and home office expenses.

(2) **Unit Price.** By application of Unit Prices included in the Contract or subsequently agreed to by the parties. However, if the character or quantity originally contemplated is materially changed so that application of such unit price to quantities of Work proposed will cause substantial inequity to either party, the applicable unit price shall be equitably adjusted.

(3) **Force Account.** By directing the Contractor to proceed with the change in the Work on a "force account" basis under which the Contractor shall be reimbursed for reasonable expenditures incurred by the Contractor and its Subcontractors in performing added Work and the Owner shall receive reasonable credit for any deleted Work. The Contractor shall keep and present, in such form as the Owner may prescribe, an itemized accounting of the cost of the change together with sufficient supporting data. Unless otherwise stated in the directive, the adjustment of the Contract Sum shall be limited to the following:

- (a) costs of labor and supervision, including employee benefits, social security, retirement, unemployment and workers' compensation insurance required by law, agreement, or under

Contractor's or Subcontractor's standard personnel policy;

- (b) cost of materials, supplies and equipment, including cost of delivery, whether incorporated or consumed;
- (c) rental cost of machinery and equipment, not to exceed prevailing local rates if contractor-owned;
- (d) costs of premiums for insurance required by the Contract Documents, permit fees, and sales, use or similar taxes related to the change in the Work;
- (e) reasonable credits to the Owner for the value of deleted Work, without Contractor or Subcontractor mark-ups; and
- (f) for additions to the Contract Sum, mark-up of the Contractor's direct costs for overhead and profit not exceeding 15% on Contractor's work nor exceeding 25% for Contractor and Subcontractor on a Subcontractor's work. No allowance for overhead and profit shall be figured on a change which involves a net credit to the Owner. For the purposes of this method of determining an adjustment of the Contract Sum, "overhead" shall cover the Contractor's indirect costs of the change, such as the cost of insurance other than mentioned above, bonds, superintendent and other job office personnel, watchman, use and rental of small tools, job office, job office supplies and expenses, temporary facilities and utilities, and home office expenses.

**C. ADJUSTMENT of the CONTRACT TIME due to CHANGES**

(1) Unless otherwise provided in the Contract Documents, the Contract Time shall be equitably adjusted for the performance of a change provided that the Contractor notifies the Architect in writing that the change will increase the time required to complete the Work. Such notice shall be provided no later than:

- (a) with the Contractor's cost proposal stating the number of days of extension requested, or
- (b) within ten days after the Contractor receives a directive to proceed with a change in advance of submitting a cost proposal, in which case the notice should provide an estimated number of days of extension to be requested, which may be subject to adjustment in the cost proposal.

(2) The Contract Time shall be extended only to the extent that the change affects the time required to complete the entire Work of the Contract, taking into account the concurrent performance of the changed and unchanged Work.

**D. CHANGE ORDER PROCEDURES**

(1) If the Owner proposes to make a change in the Work, the Architect will request that the Contractor provide a cost proposal for making the change to the Work. The request shall be in writing and shall adequately describe the proposed change using drawings, specifications, narrative, or a combination thereof. Within 21 days after receiving such a request, or such other time as may be stated in the request, the Contractor shall prepare and submit to the Architect a written proposal, properly itemized and supported by sufficient substantiating data to facilitate evaluation. The stated time within which the Contractor must submit a proposal may be extended if, within that time, the Contractor makes a written request with reasonable justification thereof.

(2) The Contractor may voluntarily offer a change proposal which, in the Contractor's opinion, will reduce the cost of construction, maintenance, or operation or will improve the cost-effective performance of an element of the Project, in which case the Owner, through the Architect, will

accept, reject, or respond otherwise within 21 days after receipt of the proposal, or such other reasonable time as the Contractor may state in the proposal.

(3) If the Contractor's proposal is acceptable to the Owner, or is negotiated to the mutual agreement of the Contractor and Owner, the Architect will prepare an appropriate Contract Change Order for execution. Upon receipt of the fully executed Contract Change Order, the Contractor shall proceed with the change.

(4) In advance of delivery of a fully executed Contract Change Order, the Architect may furnish to the Contractor a written authorization to proceed with an agreed change. However, such an authorization shall be effective only if it:

- (a) identifies the Contractor's accepted or negotiated proposal for the change,
- (b) states the agreed adjustments, if any, in Contract Sum and Contract Time,
- (c) states that funds are available to pay for the change, and
- (d) is signed by the Owner.

(5) If the Contractor and Owner cannot agree on the amount of the adjustment in the Contract Sum for a change, the Owner, through the Architect, may order the Contractor to proceed with the change on a Force Account basis, but the net cost to the Owner shall not exceed the amount quoted in the Contractor's proposal. Such order shall state that funds are available to pay for the change.

(6) If the Contractor does not promptly respond to a request for a proposal, or the Owner determines that the change is essential to the final product of the Work and that the change must be effected immediately to avoid delay of the Project, the Owner may:

- (a) determine with the Contractor a sufficient maximum amount to be authorized for the change and
- (b) direct the Contractor to proceed with the change on a Force Account basis pending delivery of the Contractor's proposal, stating the maximum increase in the Contract Sum that is authorized for the change.

(7) Pending agreement of the parties or final resolution of any dispute of the total amount due the Contractor for a change in the Work, amounts not in dispute for such changes in the Work may be included in Applications for Payment accompanied by an interim Change Order indicating the parties' agreement with part of all of such costs or time extension. Once a dispute is resolved, it shall be implemented by preparation and execution of an appropriate Change Order.

## **ARTICLE 20**

### **CLAIMS for EXTRA COST or EXTRA WORK**

- A. If the Contractor considers any instructions by the Architect, Owner, BC Project Inspector, or public authority having jurisdiction to be contrary to the requirements of the Contract Documents and will involve extra work and/or cost under the Contract, the Contractor shall give the Architect written notice thereof within ten days after receipt of such instructions, and in any event before proceeding to execute such work. As used in this Article, "instructions" shall include written or oral clarifications, directions, instructions, interpretations, or determinations.
- B. The Contractor's notification pursuant to Paragraph 20.A shall state: (1) the date, circumstances,

and source of the instructions, (2) that the Contractor considers the instructions to constitute a change to the Contract Documents and why, and (3) an estimate of extra cost and time that may be involved to the extent an estimate may be reasonably made at that time.

- C. Except for claims relating to an emergency endangering life or property, no claim for extra cost or extra work shall be considered in the absence of prior notice required under Paragraph 20.A.
- D. Within ten days of receipt of a notice pursuant to Paragraph 20.A, the Architect will respond in writing to the Contractor, stating one of the following:
  - (1) The cited instruction is rescinded.
  - (2) The cited instruction is a change in the Work and in which manner the Contractor is to proceed with procedures of Article 19, Changes in the Work.
  - (3) The cited instruction is reconfirmed, is not considered by the Architect to be a change in the Contract Documents, and the Contractor is to proceed with Work as instructed.
- E. If the Architect's response to the Contractor is as in Paragraph 20.D(3), the Contractor shall proceed with the Work as instructed. If the Contractor continues to consider the instructions to constitute a change in the Contract Documents, the Contractor shall, within ten days after receiving the Architect's response, notify the Architect in writing that the Contractor intends to submit a claim pursuant to Article 24, Resolution of Claims and Disputes

## **ARTICLE 21**

### **DIFFERING SITE CONDITIONS**

#### **A. DEFINITION**

**"Differing Site Conditions" are:**

- (1) subsurface or otherwise concealed physical conditions at the Project site which differ materially from those indicated in the Contract Documents, or
- (2) unknown physical conditions at the Project site which are of an unusual nature, differing materially from conditions ordinarily encountered and generally recognized as inherent in construction activities of the character required by the Contract Documents.

#### **B. PROCEDURES**

If Differing Site Conditions are encountered, then the party discovering the condition shall promptly notify the other party before the condition is disturbed and in no event later than ten days after discovering the condition. Upon such notice and verification that a Differing Site Condition exists, the Architect will, with reasonable promptness and with the Owner's concurrence, make changes in the Drawings and/or Specifications as are deemed necessary to conform to the Differing Site Condition. Any increase or decrease in the Contract Sum or Contract Time that is warranted by the changes will be made as provided under Article 19, Changes in the Work. If the Architect determines a Differing Site Condition has not been encountered, the Architect shall notify the Owner and Contractor in writing, stating the reason for that determination.

**ARTICLE 22**  
**CLAIMS for DAMAGES**

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

**ARTICLE 23**  
**DELAYS**

- A. A delay beyond the Contractor's control at any time in the commencement or progress of Work by an act or omission of the Owner, Architect, or any separate contractor or by labor disputes, unusual delay in deliveries, unavoidable casualties, fires, abnormal floods, tornadoes, or other cataclysmic events of nature, may entitle the Contractor to an extension of the Contract Time provided, however, that the Contractor shall, within ten days after the delay first occurs, give written notice to the Architect of the cause of the delay and its probable effect on progress of the entire Work.
- B. Adverse weather conditions that are more severe than anticipated for the locality of the Work during any given month may entitle the Contractor to an extension of Contract Time provided, however;
- (1) the weather conditions had an adverse effect on construction scheduled to be performed during the period in which the adverse weather occurred, which in reasonable sequence would have an effect on completion of the entire Work,
  - (2) the Contractor shall, within twenty-one days after the end of the month in which the delay occurs, give the Architect written notice of the delay that occurred during that month and its probable effect on progress of the Work, and
  - (3) within a reasonable time after giving notice of the delay, the Contractor provides the Architect with sufficient data to document that the weather conditions experienced were unusually severe for the locality of the Work during the month in question. Unless otherwise provided in the Contract Documents, data documenting unusually severe weather conditions shall compare actual weather conditions to the average weather conditions for the month in question during the previous five years as recorded by the National Oceanic and Atmospheric Administration (NOAA) or similar record-keeping entities.
- C. Adjustments, if any, of the Contract Time pursuant to this Article shall be incorporated into the Contract by a Contract Change Order prepared by the Architect and signed by the Contractor, Owner, and other signatories to the Construction Contract or, at closeout of the Contract, by mutual written agreement between the Contractor and Owner. The adjustment of the Contract Time shall not exceed the extent to which the delay extends the time required to complete the entire Work of the Contract.
- D. The Contractor shall not be entitled to any adjustment of the Contract Sum for damage due to



delays claimed pursuant to this Article unless the delay was caused by the Owner or Architect and was either:

- (1) the result of bad faith or active interference or
- (2) beyond the contemplation of the parties and not remedied within a reasonable time after notification by the Contractor of its presence.

## **ARTICLE 24**

### **RESOLUTION of CLAIMS and DISPUTES**

#### **A. APPLICABILITY of ARTICLE**

(1) As used in this Article, "Claims and Disputes" include claims or disputes asserted by the Contractor, its Surety, or Owner arising out of or related to the Contract, or its breach, including without limitation claims seeking, under the provisions of the Contract, equitable adjustment of the Contract Sum or Contract Time and claims and disputes arising between the Contractor (or its Surety) and Owner regarding interpretation of the Contract Documents, performance of the Work, or breach of or compliance with the terms of the Contract.

(2) "Resolution" addressed in this Article applies only to Claims and Disputes arising between the Contractor (or its Surety) and Owner and asserted after execution of the Construction Contract and prior to the date upon which final payment is made. Upon making application for final payment the Contractor may reserve the right to subsequent Resolution of existing Claims by including a list of all Claims, in stated amounts, which remain to be resolved and specifically excluding them from any release of claims executed by the Contractor, and in that event Resolution may occur after final payment is made.

#### **B. CONTINUANCE of PERFORMANCE**

An unresolved Claim or Dispute shall not be just cause for the Contractor to fail or refuse to proceed diligently with performance of the Contract or for the Owner to fail or refuse to continue to make payments in accordance with the Contract Documents.

#### **C. GOOD FAITH EFFORT to SETTLE**

The Contractor and Owner agree that, upon the assertion of a Claim by the other, they will make a good faith effort, with the Architect's assistance and advice, to achieve mutual resolution of the Claim. If mutually agreed, the Contractor and Owner may endeavor to resolve a Claim through mediation. If efforts to settle are not successful, the Claim shall be resolved in accordance with paragraph D or E below, whichever applies.

#### **D. FINAL RESOLUTION for STATE-FUNDED CONTRACTS**

(1) If the Contract is funded in whole or in part with state funds, the final Resolution of Claims and Disputes which cannot be resolved by the Contractor (or its Surety) and Owner shall be by the Director, whose decision shall be final, binding, and conclusive upon the Contractor, its Surety, and the Owner.

(2) When it becomes apparent to the party asserting a Claim (the Claimant) that an impasse to

mutual resolution has been reached, the Claimant may request in writing to the Director that the Claim be resolved by decision of the Director. Such request by the Contractor (or its Surety) shall be submitted through the Owner. Should the Owner fail or refuse to submit the Contractor's request within ten days of receipt of same, the Contractor may forward such request directly to the Director. Upon receipt of a request to resolve a Claim, the Director will instruct the parties as to procedures to be initiated and followed.

(3) If the respondent to a Claim fails or refuses to participate or cooperate in the Resolution procedures to the extent that the Claimant is compelled to initiate legal proceedings to induce the Respondent to participate or cooperate, the Claimant will be entitled to recover, and may amend its Claim to include, the expense of reasonable attorney's fees so incurred.

**E. FINAL RESOLUTION for LOCALLY-FUNDED CONTRACTS**

If the Contract is funded in whole with funds provided by a city or county board of education or other local governmental authority and the Contract Documents do not stipulate a binding alternative dispute resolution method, the final resolution of Claims and Disputes which cannot be resolved by the Contractor (or its Surety) and Owner may be by any legal remedy available to the parties. Alternatively, upon the written agreement of the Contractor (or its Surety) and the Owner, final Resolution of Claims and Disputes may be by submission to binding arbitration before a neutral arbitrator or panel or by submission to the Director in accordance with preceding Paragraph D.

**ARTICLE 25**  
**OWNER'S RIGHT to CORRECT DEFECTIVE WORK**

If the Contractor fails or refuses to correct Defective Work in a timely manner that will avoid delay of completion, use, or occupancy of the Work or work by the Owner or separate contractors, the Architect may give the Contractor written Notice to Cure the Defective Work within a reasonable, stated time. If within ten days after receipt of the Notice to Cure the Contractor has not proceeded and satisfactorily continued to cure the Defective Work or provided the Architect with written verification that satisfactory positive action is in process to cure the Defective Work, the Owner may, without prejudice to any other remedy available to the Owner, correct the Defective Work and deduct the actual cost of the correction from payment then or thereafter due to the Contractor.

**ARTICLE 26**  
**OWNER'S RIGHT to STOP or SUSPEND the WORK**

**A. STOPPING the WORK for CAUSE**

If the Contractor fails to correct Defective Work or persistently fails to carry out Work in accordance with the Contract Documents, the Owner may direct the Contractor in writing to stop the Work, or any part of the Work, until the cause for the Owner's directive has been eliminated; however, the Owner's right to stop the Work shall not be construed as a duty of the Owner to be exercised for the benefit of the Contractor or any other person or entity.

**B. SUSPENSION by the OWNER for CONVENIENCE**

(1) The Owner may, at any time and without cause, direct the Contractor in writing to suspend, delay or interrupt the Work, or any part of the Work, for a period of time as the Owner may determine.

(2) The Contract Sum and Contract Time shall be adjusted, pursuant to Article 19, for reasonable increases in the cost and time caused by an Owner-directed suspension, delay or interruption of Work for the Owner's convenience. However, no adjustment to the Contract Sum shall be made to the extent that the same or concurrent Work is, was or would have been likewise suspended, delayed or interrupted for other reasons not caused by the Owner.

## **ARTICLE 27**

### **OWNER'S RIGHT to TERMINATE CONTRACT**

#### **A. TERMINATION by the OWNER for CAUSE**

(1) **Causes:** The Owner may terminate the Contractor's right to complete the Work, or any designated portion of the Work, if the Contractor:

- (a) should be adjudged bankrupt, or should make a general assignment for the benefit of the Contractor's creditors, or if a receiver should be appointed on account of the Contractor's insolvency to the extent termination for these reasons is permissible under applicable law;
- (b) refuses or fails to prosecute the Work, or any part of the Work, with the diligence that will insure its completion within the Contract Time, including any extensions, or fails to complete the Work within the Contract Time;
- (c) refuses or fails to perform the Work, including prompt correction of Defective Work, in a manner that will insure that the Work, when fully completed, will be in accordance with the Contract Documents;
- (d) fails to pay for labor or materials supplied for the Work or to pay Subcontractors in accordance with the respective Subcontract;
- (e) persistently disregards laws, ordinances, or rules, regulations or orders of a public authority having jurisdiction, or the instructions of the Architect or Owner; or
- (f) is otherwise guilty of a substantial breach of the Contract.

(2) **Procedure for Unbonded Construction Contracts (Generally, contracts less than \$50,000):**

- (a) **Notice to Cure:** In the presence of any of the above conditions the Architect may give the Contractor written notice to cure the condition within a reasonable, stated time, but not less than ten days after the Contractor receives the notice.
- (b) **Notice of Termination:** If, at the expiration of the time stated in the Notice to Cure, the Contractor has not proceeded and satisfactorily continued to cure the condition or provided the Architect with written verification that satisfactory positive action is in process to cure the condition, the Owner may, without prejudice to any other rights or remedies of the Owner, give the Contractor written notice that the Contractor's right to complete the Work, or a designated portion of the Work, shall terminate seven days after the Contractor's receipt of the written Notice of Termination.
- (c) If the Contractor satisfies a Notice to Cure, but the condition for which the notice was first given reoccurs, the Owner may give the Contractor a seven day Notice of Termination

without giving the Contractor another Notice to Cure.

(d) At the expiration of the seven days of the termination notice, the Owner may:

.1 take possession of the site, of all materials and equipment stored on and off site, and of all Contractor-owned tools, construction equipment and machinery, and facilities located at the site, and

.2 finish the Work by whatever reasonable method the Owner may deem expedient.

(e) The Contractor shall not be entitled to receive further payment under the Contract until the Work is completed.

(f) If the Owner's cost of completing the Work, including correction of Defective Work, compensation for additional architectural, engineering, managerial, and administrative services, and reasonable attorneys' fees due to the default and termination, is less than the unpaid balance of the Contract Sum, the excess balance less liquidated damages for delay shall be paid to the Contractor. If such cost to the Owner including attorney's fees, plus liquidated damages, exceeds the unpaid balance of the Contract Sum, the Contractor shall pay the difference to the Owner. Final Resolution of any claim or Dispute involving the termination or any amount due any party as a result of the termination shall be pursuant to Article 24.

(g) Upon the Contractor's request, the Owner shall furnish to the Contractor a detailed accounting of the Owner's cost of completing the Work.

**(3) Procedure for Bonded Construction Contracts (Generally, contracts over \$50,000):**

(a) **Notice to Cure:** In the presence of any of the above conditions the Architect may give the Contractor and its Surety written Notice to Cure the condition within a reasonable, stated time, but not less than ten days after the Contractor receives the notice.

(b) **Notice of Termination:** If, at the expiration of the time stated in the Notice to Cure, the Contractor has not proceeded and satisfactorily continued to cure the condition or provided the Architect with written verification that satisfactory positive action is in process to cure the condition, the Owner may, without prejudice to any other rights or remedies of the Owner, give the Contractor and its Surety written notice declaring the Contractor to be in default under the Contract and stating that the Contractor's right to complete the Work, or a designated portion of the Work, shall terminate seven days after the Contractor's receipt of the written Notice of Termination.

(c) If the Contractor satisfies a Notice to Cure, but the condition for which the notice was first given reoccurs, the Owner may give the Contractor a Notice of Termination without giving the Contractor another Notice to Cure.

(d) **Demand on the Performance Bond:** With the Notice of Termination the Owner shall give the Surety a written demand that, upon the effective date of the Notice of Termination, the Surety promptly fulfill its obligation to take charge of and complete the Work in accordance with the terms of the Performance Bond.

(e) **Surety Claims:** Upon receiving the Owner's demand on the Performance Bond, the Surety shall assume all rights and obligations of the Contractor under the Contract. However, the Surety shall also have the right to assert "Surety Claims" to the Owner, which are defined as claims relating to acts or omissions of the Owner or Architect prior to termination of the Contractor which may have prejudiced its rights as Surety or its interest in the unpaid balance of the Contract Sum. If the Surety wishes to assert a Surety Claim, it shall give the Owner, through the Architect, written notice within twenty-one days after first recognizing the condition giving rise to the Surety Claim. The Surety Claim shall then be submitted to the Owner, through the Architect, no later than sixty days after giving notice thereof, but no such Surety Claims shall be considered if submitted after the date upon which final payment

becomes due. Final resolution of Surety Claims shall be pursuant to Article 24, Resolution of Claims and Disputes. The presence or possibility of a Surety Claim shall not be just cause for the Surety to fail or refuse to take charge of and complete the Work or for the Owner to fail or refuse to continue to make payments in accordance with the Contract Documents.

**(f) Payments to Surety:** The Surety shall be paid for completing the Work in accordance with the Contract Documents as if the Surety were the Contractor. The Owner shall have the right to deduct from payments to the Surety any reasonable costs incurred by the Owner, including compensation for additional architectural, engineering, managerial, and administrative services, and attorneys' fees as necessitated by termination of the Contractor and completion of the Work by the Surety. No further payments shall be made to the Contractor by the Owner. The Surety shall be solely responsible for any accounting to the Contractor for the portion of the Contract Sum paid to Surety by Owner or for the costs and expenses of completing the Work.

**(4) Wrongful Termination:** If any notice of termination by the Owner for cause, made in good faith, is determined to have been wrongly given, such termination shall be effective and compensation therefore determined as if it had been a termination for convenience pursuant to Paragraph B below.

**B. TERMINATION by the OWNER for CONVENIENCE**

**(1)** The Owner may, without cause and at any time, terminate the performance of Work under the Contract in whole, or in part, upon determination by the Owner that such termination is in the Owner's best interest. Such termination is referred to herein as Termination for Convenience.

**(2)** Upon receipt of a written notice of Termination for Convenience from the Owner, the Contractor shall:

- (a)** stop Work as specified in the notice;
- (b)** enter into no further subcontracts or purchase orders for materials, services, or facilities, except as may be necessary for Work directed to be performed prior to the effective date of the termination or to complete Work that is not terminated;
- (c)** terminate all existing subcontracts and purchase orders to the extent they relate to the terminated Work;
- (d)** take such actions as are necessary, or directed by the Architect or Owner, to protect, preserve, and make safe the terminated Work; and
- (e)** complete performance of the Work that is not terminated.

**(3)** In the event of Termination for Convenience, the Contractor shall be entitled to receive payment for the Work performed prior to its termination, including materials and equipment purchased and delivered for incorporation into the terminated Work, and any reasonable costs incurred because of the termination. Such payment shall include reasonable mark-up of costs for overhead and profit, not to exceed the limits stated in Article 19, Changes in the Work. The Contractor shall be entitled to receive payment for reasonable anticipated overhead ("home office") and shall not be entitled to receive payment for any profits anticipated to have been gained from the terminated Work. A proposal for decreasing the Contract Sum shall be submitted to the Architect by the Contractor in such time and detail, and with such supporting documentation, as is reasonably directed by the Owner. Final modification of the Contract shall be by Contract Change Order pursuant to Article 19. Any Claim or Dispute involving the termination or any amount due a party as a result shall be resolved pursuant to Article 24.

**ARTICLE 28**  
**CONTRACTOR'S RIGHT to SUSPEND or TERMINATE the CONTRACT**

**A. SUSPENSION by the OWNER**

If all of the Work is suspended or delayed for the Owner's convenience or under an order of any court, or other public authority, for a period of sixty days, through no act or fault of the Contractor or a Subcontractor, or anyone for whose acts they may be liable, then the Contractor may give the Owner a written Notice of Termination which allows the Owner fourteen days after receiving the Notice in which to give the Contractor appropriate written authorization to resume the Work. Absent the Contractor's receipt of such authorization to resume the Work, the Contract shall terminate upon expiration of this fourteen day period and the Contractor will be compensated by the Owner as if the termination had been for the Owner's convenience pursuant to Article 27.B.

**B. NONPAYMENT**

The Owner's failure to pay the undisputed amount of an Application for Payment within sixty days after receiving it from the Architect (Certified pursuant to Article 30) shall be just cause for the Contractor to give the Owner fourteen days' written notice that the Work will be suspended pending receipt of payment but that the Contract shall terminate if payment is not received within fourteen days (or a longer period stated by the Contractor) of the expiration of the fourteen day notice period.

(1) If the Work is then suspended for nonpayment, but resumed upon receipt of payment, the Contractor will be entitled to compensation as if the suspension had been by the Owner pursuant to Article 26, Paragraph B.

(2) If the Contract is then terminated for nonpayment, the Contractor will be entitled to compensation as if the termination had been by the Owner pursuant to Article 27, Paragraph B.

**ARTICLE 29**  
**PROGRESS PAYMENTS**

**A. FREQUENCY of PROGRESS PAYMENTS**

Unless otherwise provided in the Contract Documents, the Owner will make payments to the Contractor as the Work progresses based on monthly estimates prepared and certified by the Contractor, approved and certified by the Architect, and approved by the Owner and other authorities whose approval is required.

**B. SCHEDULE of VALUES**

Within ten days after receiving the Notice to Proceed the Contractor shall submit to the Architect a Schedule of Values, which is a breakdown of the Contract Sum showing the value of the various

parts of the Work for billing purposes. The Schedule of Values shall be prepared on 8 1/2" x 11" paper in a format that is acceptable to the Architect and Owner and shall divide the Contract Sum into as many parts ("line items") as the Architect and Owner determine necessary to permit evaluation and to show amounts attributable to Subcontractors. The Contractor's overhead and profit are to be proportionately distributed throughout the line items of the Schedule of Values. Upon approval, the Schedule of Values shall be used as a basis for monthly Applications for Payment, unless it is later found to be in error. Approved change order amounts shall be added to or incorporated into the Schedule of Values as mutually agreed by the Contractor and Architect.

#### **C. APPLICATIONS for PAYMENTS**

(1) Based on the approved Schedule of Values, each monthly Application for Payment shall show the Contractor's estimate of the value of Work performed in each line item as of the end of the billing period. The Contractor's cost of materials and equipment not yet incorporated into the Work, but delivered and suitably stored on the site, may be considered in monthly Applications for Payment.

(2) The Contractor's estimate of the value of Work performed and stored materials must represent such reasonableness as to warrant certification by the Architect to the Owner in accordance with Article 30. Each monthly Application for Payment shall be supported by such data as will substantiate the Contractor's right to payment, including without limitation copies of requisitions from subcontractors and material suppliers.

(3) If no other date is stated in the Contract Documents or agreed upon by the parties, each monthly Application for Payment shall be submitted to the Architect on or about the first day of each month and payment shall be issued to the Contractor within thirty days after an Application for Payment is Certified pursuant to Article 30 and delivered to the Owner

#### **D. MATERIALS STORED OFF SITE**

Unless otherwise provided in the Contract Documents, the Contractor's cost of materials and equipment to be incorporated into the Work, which are stored off the site, may also be considered in monthly Applications for Payment under the following conditions:

- (1) the contractor has received written approval from the Architect and Owner to store the materials or equipment off site in advance of delivering the materials to the off site location;
- (2) a Certificate of Insurance is furnished to the Architect evidencing that a special insurance policy, or rider to an existing policy, has been obtained by the Contractor providing all-risk property insurance coverage, specifically naming the materials or equipment stored, and naming the Owner as an additionally insured party;
- (3) the Architect is provided with a detailed inventory of the stored materials or equipment and the materials or equipment are clearly marked in correlation to the inventory to facilitate inspection and verification of the presence of the materials or equipment by the Architect or Owner;
- (4) the materials or equipment are properly and safely stored in a bonded warehouse, or a facility otherwise approved in advance by the Architect and Owner; and
- (5) compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest.

**E. RETAINAGE**

(1) “Retainage” is defined as the money earned and, therefore, belonging to the Contractor (subject to final settlement of the Contract) which has been retained by the Owner conditioned on final completion and acceptance of all Work required by the Contract Documents. Retainage shall not be relied upon by Contractor (or Surety) to cover or off-set unearned monies attributable to uncompleted or uncorrected Work.

(2) In making progress payments the Owner shall retain five percent of the estimated value of Work performed and the value of the materials stored for the Work; but after retainage has been held upon fifty percent of the Contract Sum, no additional retainage will be withheld.

**F. CONTRACTOR’S CERTIFICATION**

(1) Each Application for Payment shall bear the Contractor’s notarized certification that, to the best of the Contractor’s knowledge, information, and belief, the Work covered by the Application for Payment has been completed in accordance with the Contract Documents, that all amounts have been paid by the Contractor for Work for which previous Certificates for Payments were issued and payments received from the Owner and that the current payment shown in the Application for Payment has not yet been received.

(2) By making this certification the Contractor represents to the Architect and Owner that, upon receipt of previous progress payments from the Owner, the Contractor has promptly paid each Subcontractor, in accordance with the terms of its agreement with the Subcontractor, the amount due the Subcontractor from the amount included in the progress payment on account of the Subcontractor’s Work and stored materials. The Architect and Owner may advise Subcontractors and suppliers regarding percentages of completion or amounts requested and/or approved in an Application for Payment on account of the Subcontractor’s Work and stored materials.

**G. PAYMENT ESTABLISHES OWNERSHIP**

All material and Work covered by progress payments shall become the sole property of the Owner, but the Contractor shall not be relieved from the sole responsibility for the care and protection of material and Work upon which payments have been made and for the restoration of any damaged material and Work.

**ARTICLE 30**  
**CERTIFICATION and APPROVALS for PAYMENT**

- A. The Architect’s review, approval, and certification of Applications for Payment shall be based on the Architect’s general knowledge of the Work obtained through site visits and the information provided by the Contractor with the Application. The Architect shall not be required to perform exhaustive examinations, evaluations, or estimates of the cost of completed or uncompleted Work or stored materials to verify the accuracy of amounts requested by the Contractor, but the Architect shall have the authority to adjust the Contractor’s estimate when, in the Architect’s reasonable opinion, such estimates are overstated or understated.
- B. Within seven days after receiving the Contractor’s monthly Application for Payment, or such other



time as may be stated in the Contract Documents, the Architect will take one of the following actions:

- (1) The Architect will approve and certify the Application as submitted and forward it as a Certification for Payment for approval by the Owner (and other approving authorities, if any) and payment.
  - (2) If the Architect takes exception to any amounts claimed by the Contractor and the Contractor and Architect cannot agree on revised amounts, the Architect will promptly issue a Certificate for Payment for the amount for which the Architect is able to certify to the Owner, transmitting a copy of same to the Contractor.
  - (3) To the extent the Architect determines may be necessary to protect the Owner from loss on account of any of the causes stated in Article 31, the Architect may subtract from the Contractor's estimates and will issue a Certificate for Payment to the Owner, with a copy to the Contractor, for such amount as the Architect determines is properly due and notify the Contractor and Owner in writing of the Architect's reasons for withholding payment in whole or in part.
- C. Neither the Architect's issuance of a Certificate for Payment nor the Owner's resulting progress payment shall be a representation to the Contractor that the Work in progress or completed at that time is accepted or deemed to be in conformance with the Contract Documents.
- D. The Architect shall not be required to determine that the Contractor has promptly or fully paid Subcontractors and suppliers or how or for what purpose the Contractor has used monies paid under the Construction Contract. However, the Architect may, upon request and if practical, inform any Subcontractor or supplier of the amount, or percentage of completion, approved or paid to the Contractor on account of the materials supplied or the Work performed by the Subcontractor.

### **ARTICLE 31** **PAYMENTS WITHHELD**

- A. The Architect may nullify or revise a previously issued Certificate for Payment prior to Owner's payment thereunder to the extent as may be necessary in the Architect's opinion to protect the Owner from loss on account of any of the following causes not discovered or fully accounted for at the time of the certification or approval of the Application for Payment:
- (1) Defective Work;
  - (2) filed, or reasonable evidence indicating probable filing of, claims arising out of the Contract by other parties against the Contractor;
  - (3) the Contractor's failure to pay for labor, materials or equipment or to pay Subcontractors;
  - (4) reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
  - (5) damage suffered by the Owner or another contractor caused by the Contractor, a Subcontractor, or anyone for whose acts they may be liable;
  - (6) reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance is insufficient to cover applicable liquidated damages; or
  - (7) the Contractor's persistent failure to conform to the requirements of the Contract Documents.
- B. If the Owner deems it necessary to withhold payment pursuant to preceding Paragraph A, the

Owner will notify the Contractor and Architect in writing of the amount to be withheld and the reason for same.

- C. The Architect shall not be required to withhold payment for completed or partially completed Work for which compliance with the Contract Documents remains to be determined by Specified Inspections or Final Inspections to be performed in their proper sequence. However, if Work for which payment has been approved, certified, or made under an Application for Payment is subsequently determined to be Defective Work, the Architect shall determine an appropriate amount that will protect the Owner's interest against the Defective Work.
  - (1) If payment has not been made against the Application for Payment first including the Defective Work, the Architect will notify the Owner and Contractor of the amount to be withheld from the payment until the Defective Work is brought into compliance with the Contract Documents.
  - (2) If payment has been made against the Application for Payment first including the Defective Work, the Architect will withhold the appropriate amount from the next Application for Payment submitted after the determination of noncompliance, such amount to then be withheld until the Defective Work is brought into compliance with the Contract Documents.
- D. The amount withheld will be paid with the next Application for Payment certified and approved after the condition for which the Owner has withheld payment is removed or otherwise resolved to the Owner's satisfaction.
- E. The Owner shall have the right to withhold from payments due the Contractor under this Contract an amount equal to any amount which the Contractor owes the Owner under another contract.

## **ARTICLE 32**

### **SUBSTANTIAL COMPLETION**

- A. Substantial Completion is the stage in the progress of the Work when the Work or designated portion of the Work is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use without disruption or interference by the Contractor in completing or correcting any remaining unfinished Work ("punch list" items). Substantial Completion of the Work, or a designated portion of the Work, is not achieved until so agreed in a Certificate of Substantial Completion signed by the Contractor, Architect, Owner, and Technical Staff of the Alabama Building Commission.
- B. The Contractor shall notify the Architect in writing when it considers the Work, or a portion of the Work which the Owner has agreed to accept separately, to be substantially complete and ready for a Final Inspection pursuant to Article 16. In this notification the Contractor shall identify any items remaining to be completed or corrected for Final Acceptance prior to final payment.
- C. Substantial Completion is achieved and a Final Inspection is appropriate only when a minimal number of punch list items exists and only a short period of time will be required to correct or complete them. Upon receipt of the Contractor's notice for a Final Inspection, the Architect will advise the Contractor in writing of any conditions of the Work which the Architect or Owner is aware do not constitute Substantial Completion, otherwise, a Final Inspection will proceed within a

reasonable time after the Contractor's notice is given. However, the Architect will not be required to prepare lengthy listings of punch list items; therefore, if the Final Inspection discloses that Substantial Completion has not been achieved, the Architect may discontinue or suspend the inspection until the Contractor does achieve Substantial Completion.

**D. CERTIFICATE of SUBSTANTIAL COMPLETION**

(1) When the Work or a designated portion of the Work is substantially complete, the Architect will prepare and sign a Certificate of Substantial Completion to be signed in order by the Contractor, Owner, and Alabama Building Commission.

(2) When signed by all parties, the Certificate of Substantial Completion shall establish the Date of Substantial Completion which is the date upon which:

(a) the Work, or designated portion of the Work, is accepted by the Architect, Owner, and Alabama Building Commission as being ready for occupancy,

(b) the Contractor's one-year and special warranties for the Work covered by the Certificate commence, unless stated otherwise in the Certificate (the one-year warranty for punch list items completed or corrected after the period allowed in the Certificate shall commence on the date of their Final Acceptance), and

(c) Owner becomes responsible for building security, maintenance, utility services, and insurance, unless stated otherwise in the Certificate.

(3) The Certificate of Substantial Completion shall set the time within which the Contractor shall finish all items on the "punch list" accompanying the Certificate. The completion of punch list items shall be a condition precedent to Final Payment.

(4) If the Work or designated portion covered by a Certificate of Substantial Completion includes roofing work, the General Contractor's (5-year) Roofing Guarantee, ABC Form C-9, must be executed by the Contractor and attached to the Certificate of Substantial Completion. If the Contract Documents specify any other roofing warranties to be provided by the roofing manufacturer, Subcontractor, or Contractor, they must also be attached to the Certificate of Substantial Completion. The Alabama Building Commission will not sign the Certificate of Substantial Completion in the absence of the roofing guarantees.

E. The Date of Substantial Completion of the Work, as set in the Certificate of Substantial Completion of the Work or of the last completed portion of the Work, establishes the extent to which the Contractor is liable for Liquidated Damages, if any; however, should the Contractor fail to complete all punch list items within thirty days, or such other time as may be stated in the respective Certificate of Substantial Completion, the Contractor shall bear any expenses, including additional Architectural services and expenses, incurred by the Owner as a result of such failure to complete punch list items in a timely manner.

**ARTICLE 33**  
**OCCUPANCY or USE PRIOR to COMPLETION**

**A. UPON SUBSTANTIAL COMPLETION**

Prior to completion of the entire Work, the Owner may occupy or begin utilizing any designated

portion of the Work on the agreed Date of Substantial Completion of that portion of the Work.

**B. BEFORE SUBSTANTIAL COMPLETION**

- (1) The Owner shall not occupy or utilize any portion of the Work before Substantial Completion of that portion has been achieved.
- (2) The Owner may deliver furniture and equipment and store, or install it in place ready for occupancy and use, in any designated portion of the Work before it is substantially completed under the following conditions:
  - (a) The Owner's storage or installation of furniture and equipment will not unreasonably disrupt or interfere with the Contractor's completion of the designated portion of the Work.
  - (b) The Contractor consents to the Owner's planned action (such consent shall not be unreasonably withheld).
  - (c) The Owner shall be responsible for insurance coverage of the Owner's furniture and equipment, and the Contractor's liability shall not be increased.
  - (d) The Contractor, Architect, and Owner will jointly inspect and record the condition of the Work in the area before the Owner delivers and stores or installs furniture and equipment; the Owner will equitably compensate the Contractor for making any repairs to the Work that may subsequently be required due to the Owner's delivery and storage or installation of furniture and equipment.
  - (e) The Owner's delivery and storage or installation of furniture and equipment shall not be deemed an acceptance of any Work not completed in accordance with the requirements of the Contract Documents.

**ARTICLE 34  
FINAL PAYMENT**

**A. PREREQUISITES to FINAL PAYMENT**

The following conditions are prerequisites to Final Payment becoming due the Contractor:

- (1) Full execution of a Certificate of Substantial Completion for the Work, or each designated portion of the Work.
- (2) Final Acceptance of the Work.
- (3) The Contractor's completion, to the satisfaction of the Architect and Owner, of all documentary requirements of the Contract Documents; such as delivery of "as-built" documents, operating and maintenance manuals, warranties, etc.
- (4) Delivery to the Owner of a final Application for Payment, prepared by the Contractor and approved and certified by the Architect.
- (5) Completion of an Advertisement for Completion pursuant to Paragraph C below.
- (6) Delivery by the Contractor to the Owner through the Architect of a Release of Claims and such other documents as may be required by Owner, satisfactory in form to the Owner pursuant to Paragraph D below.
- (7) Consent of Surety, if any, to Final Payment to Contractor.
- (8) Delivery by the Contractor to the Architect and Owner of other documents, if any, required by the Contract Documents as prerequisites to Final Payment.

**B. FINAL ACCEPTANCE of the WORK**

“Final Acceptance of the Work” shall be achieved when all “punch list” items recorded with the Certificate(s) of Substantial Completion are accounted for by either: **(1)** their completion or correction by the Contractor and acceptance by the Architect, Owner, and BC Project Inspector, or **(2)** their resolution under Article 18, Deductions for Uncorrected Work.

**C. ADVERTISEMENT for COMPLETION**

**(1) If the Contract Sum is less than \$50,000:** The Owner, immediately after being notified by the Architect that all other requirements of the Contract have been completed, shall give public notice of completion of the Contract by having an Advertisement for Completion published one time in a newspaper of general circulation, published in the county in which the Owner is located and shall post notice of completion of the Contract on the Owner’s bulletin board for one week, and shall require the Contractor to certify under oath that all bills have been paid in full. Final payment may be made at any time after the notice has been posted for one entire week.

**(2) If the Contract Sum is more than \$50,000:** The Contractor, immediately after being notified by the Architect that all other requirements of the Contract have been completed, shall give public notice of completion of the Contract by having an Advertisement for Completion, similar to the sample contained in the Project Manual, published for a period of four successive weeks in some newspaper of general circulation published within the city or county where the Work was performed. Proof of publication of the Advertisement for Completion, in duplicate, shall be made by the Contractor to the Architect by affidavit of the publisher and a printed copy of the Advertisement for Completion published, in duplicate. If no newspaper is published in the county where the work was done, the notice may be given by posting at the Court House for thirty days and proof of same made by Probate Judge or Sheriff and the Contractor. Final payment shall not be due until thirty days after this public notice is completed.

**D. RELEASE of CLAIMS**

The Release of Claims and other documents referenced in Paragraph A(6) above are as follows:

**(1)** A release executed by Contractor of all claims and claims of lien against the Owner arising under and by virtue of the Contract, other than such claims of the Contractor, if any, as may have been previously made in writing and as may be specifically excepted by the Contractor from the operation of the release in stated amounts to be set forth therein.

**(2)** An affidavit under oath, if required, stating that so far as the Contractor has knowledge or information, there are no claims or claims of lien which have been or will be filed by any Subcontractor, Supplier or other party for labor or material for which a claim or claim of lien could be filed.

**(3)** A release, if required, of all claims and claims of lien made by any Subcontractor, Supplier or other party against the Owner or unpaid Contract funds held by the Owner arising under or related to the Work on the Project; provided, however, that if any Subcontractor, Supplier or others refuse to furnish a release of such claims or claims of lien, the Contractor may furnish a bond executed by Contractor and its Surety to the Owner to provide an unconditional obligation to defend, indemnify

and hold harmless the Owner against any loss, cost or expense, including attorney's fees, arising out of or as a result of such claims, or claims of lien, in which event Owner may make Final Payment notwithstanding such claims or claims of lien. If Contractor and Surety fail to fulfill their obligations to Owner under the bond, the Owner shall be entitled to recover damages as a result of such failure, including all costs and reasonable attorney's fees incurred to recover such damages.

**E. EFFECT of FINAL PAYMENT**

(1) The making of Final Payment shall constitute a waiver of Claims by the Owner except those arising from:

- (a) liens, claims, security interests or encumbrances arising out of the Contract and unsettled;
- (b) failure of the Work to comply with the requirements of the Contract Documents;
- (c) terms of warranties or indemnities required by the Contract Documents, or
- (d) latent defects.

(2) Acceptance of Final Payment by the Contractor shall constitute a waiver of claims by Contractor except those previously made in writing, identified by Contractor as unsettled at the time of final Application for Payment, and specifically excepted from the release provided for in Paragraph D(1), above.

**ARTICLE 35  
CONTRACTOR'S WARRANTY**

**A. GENERAL WARRANTY**

The Contractor warrants to the Owner and Architect that all materials and equipment furnished under the Contract will be of good quality and new, except such materials as may be expressly provided or allowed in the Contract Documents to be otherwise, and that none of the Work will be Defective Work as defined in Article 1.

**B. ONE-YEAR WARRANTY**

(1) If, within one year after the date of Substantial Completion of the Work or each designated portion of the Work (or otherwise as agreed upon in a mutually-executed Certificate of Substantial Completion), any of the Work is found to be Defective Work, the Contractor shall promptly upon receipt of written notice from the Owner or Architect, and without expense to either, replace or correct the Defective Work to conform to the requirements of the Contract Documents, and repair all damage to the site, the building and its contents which is the result of Defective Work or its replacement or correction.

(2) The one-year warranty for punch list items shall begin on the Date of Substantial Completion if they are completed or corrected within the time period allowed in the Certificate of Substantial Completion in which they are recorded. The one-year warranty for punch list items that are not completed or corrected within the time period allowed in the Certificate of Substantial Completion, and other Work performed after Substantial Completion, shall begin on the date of Final

Acceptance of the Work. The Contractor's correction of Work pursuant to this warranty does not extend the period of the warranty. The Contractor's one-year warranty does not apply to defects or damages due to improper or insufficient maintenance, improper operation, or wear and tear during normal usage.

(3) Upon recognizing a condition of Defective Work, the Owner shall promptly notify the Contractor of the condition. If the condition is causing damage to the building, its contents, equipment, or site, the Owner shall take reasonable actions to mitigate the damage or its continuation, if practical. If the Contractor fails to proceed promptly to comply with the terms of the warranty, or to provide the Owner with satisfactory written verification that positive action is in process, the Owner may have the Defective Work replaced or corrected and the Contractor and the Contractor's Surety shall be liable for all expense incurred.

(4) **Year-end Inspection(s):** An inspection of the Work, or each separately completed portion thereof, is required near the end of the Contractor's one-year warranty period(s). The subsequent delivery of the Architect's report of a Year-end Inspection will serve as confirmation that the Contractor was notified of Defective Work found within the warranty period.

(5) The Contractor's warranty of one year is in addition to, and not a limitation of, any other remedy stated herein or available to the Owner under applicable law.

#### **C. GENERAL CONTRACTOR'S ROOFING GUARANTEE**

(1) In addition to any other roof related warranties or guarantees that may be specified in the Contract Documents, the roof and associated work shall be guaranteed by the General Contractor against leaks and defects of materials and workmanship for a period of five (5) years, starting on the Date of Substantial Completion of the Project as stated in the Certificate of Substantial Completion. This guarantee for punch list items shall begin on the Date of Substantial Completion if they are completed or corrected within the time period allowed in the Certificate of Substantial Completion in which they are recorded. The guarantee for punch list items that are not completed or corrected within the time period allowed in the Certificate of Substantial Completion shall begin on the date of Final Acceptance of the Work.

(2) The "General Contractor's Roofing Guarantee" (ABC Form C-9), included in the Project Manual, shall be executed in triplicate, signed by the appropriate party and submitted to the Architect for submission with the Certificate of Substantial Completion to the Owner and the Building Commission.

(3) This guarantee does not include costs which might be incurred by the General Contractor in making visits to the site requested by the Owner regarding roof problems that are due to lack of proper maintenance (keeping roof drains and/or gutters clear of debris that cause a stoppage of drainage which results in water ponding, overflowing of flashing, etc.), or damages caused by vandalism or misuse of roof areas. Should the contractor be required to return to the job to correct problems of this nature that are determined not to be related to faulty workmanship and materials in the installation of the roof, payment for actions taken by the Contractor in response to such request will be the responsibility of the Owner. A detailed written report shall be made by the General Contractor on each of these 'Service Calls' with copies to the Architect, Owner and Building

Commission.

**D. SPECIAL WARRANTIES**

(1) The Contractor shall deliver to the Owner through the Architect all special or extended warranties required by the Contract Documents from the Contractor, Subcontractors, and suppliers.

(2) The Contractor and the Contractor's Surety shall be liable to the Owner for such special warranties during the Contractor's one-year warranty; thereafter, the Contractor's obligations relative to such special warranties shall be to provide reasonable assistance to the Owner in their enforcement.

**E. ASSUMPTION of GUARANTEES of OTHERS**

If the Contractor disturbs, alters, or damages any work guaranteed under a separate contract, thereby voiding the guarantee of that work, the Contractor shall restore the work to a condition satisfactory to the Owner and shall also guarantee it to the same extent that it was guaranteed under the separate contract.

**ARTICLE 36  
INDEMNIFICATION AGREEMENT**

To the fullest extent permitted by law, the Contractor shall defend, indemnify, and hold harmless the Owner, Architect, Architect's consultants, Alabama Building Commission, State Department of Education (if applicable), and their agents, employees, and consultants (hereinafter collectively referred to as the "Indemnitees") from and against all claims, damages, losses and expenses, including but not limited to attorneys' fees, arising out of, related to, or resulting from performance of the Work, provided that such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property, including loss of use resulting therefrom, and is caused in whole or in part by negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, regardless of whether such claim, damage, loss or expense is caused in part, or is alleged but not legally established to have been caused in whole or in part by the negligence or other fault of a party indemnified hereunder.

- A. This indemnification shall extend to all claims, damages, losses and expenses for injury or damage to adjacent or neighboring property, or persons injured thereon, that arise out of, relate to, or result from performance of the Work.
- B. This indemnification does not extend to the liability of the Architect, or the Architect's Consultants, agents, or employees, arising out of (1) the preparation or approval of maps, shop drawings, opinions, reports, surveys, field orders, Change Orders, drawings or specifications, or (2) the giving of or the failure to give directions or instructions, provided such giving or failure to give instructions is the primary cause of the injury or damage.
- C. This indemnification does not apply to the extent of the sole negligence of the Indemnitees.



**ARTICLE 37**  
**CONTRACTOR'S and SUBCONTRACTORS' INSURANCE**

**A. GENERAL**

**(1) RESPONSIBILITY.** The Contractor shall be responsible to the Owner from the time of the signing of the Construction Contract or from the beginning of the first work, whichever shall be earlier, for all injury or damage of any kind resulting from any negligent act or omission or breach, failure or other default regarding the work by the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, regardless of who may be the owner of the property.

**(2) INSURANCE PROVIDERS.** Each of the insurance coverages required below shall be issued by an insurer licensed by the Insurance Commissioner to transact the business of insurance in the State of Alabama for the applicable line of insurance, and such insurer (or, for qualified self-insureds or group self-insureds, a specific excess insurer providing statutory limits) must have a Best Policyholders Rating of "A-" or better and a financial size rating of Class V or larger.

**(3) NOTIFICATION ENDORSEMENT.** Each policy shall be endorsed to provide that the insurance company agrees that the policy shall not be canceled, changed, allowed to lapse or allowed to expire for any reason until thirty days after the Owner has received written notice by certified mail as evidenced by return receipt or until such time as other insurance coverage providing protection equal to protection called for in the Contract Documents shall have been received, accepted and acknowledged by the Owner. Such notice shall be valid only as to the Project as shall have been designated by Project Name and Number in said notice.

**(4) INSURANCE CERTIFICATES.** The Contractor shall procure the insurance coverages identified below, or as otherwise required in the Contract Documents, at the Contractor's own expense, and to evidence that such insurance coverages are in effect, the Contractor shall furnish the Owner an insurance certificate(s) acceptable to the Owner and listing the Owner as the certificate holder. The insurance certificate(s) must be delivered to the Owner with the Construction Contract and Bonds for final approval and execution of the Construction Contract. The insurance certificate must provide the following:

- (a)** Name and address of authorized agent of the insurance company
- (b)** Name and address of insured
- (c)** Name of insurance company or companies
- (d)** Description of policies
- (e)** Policy Number(s)
- (f)** Policy Period(s)
- (g)** Limits of liability
- (h)** Name and address of Owner as certificate holder
- (i)** Project Name and Number, if any
- (j)** Signature of authorized agent of the insurance company
- (k)** Telephone number of authorized agent of the insurance company

(l) Mandatory thirty day notice of cancellation / non-renewal / change

(5) **MAXIMUM DEDUCTIBLE.** Self-insured retention, except for qualified self-insurers or group self-insurers, in any policy shall not exceed \$25,000.00.

**B. INSURANCE COVERAGES**

Unless otherwise provided in the Contract Documents, the Contractor shall purchase the types of insurance coverages with liability limits not less than as follows:

**(1) WORKERS' COMPENSATION and EMPLOYER'S LIABILITY INSURANCE**

(a) Workers' Compensation coverage shall be provided in accordance with the statutory coverage required in Alabama. A group insurer must submit a certificate of authority from the Alabama Department of Industrial Relations approving the group insurance plan. A self-insurer must submit a certificate from the Alabama Department of Industrial Relations stating the Contractor qualifies to pay its own workers' compensation claims.

(b) Employer's Liability Insurance limits shall be at least:

- .1 Bodily Injury by Accident - \$1,000,000 each accident
- .2 Bodily Injury by Disease - \$1,000,000 each employee

**(2) COMMERCIAL GENERAL LIABILITY INSURANCE**

(a) Commercial General Liability Insurance, written on an ISO Occurrence Form (current edition as of the date of Advertisement for Bids) or equivalent, shall include, but need not be limited to, coverage for bodily injury and property damage arising from premises and operations liability, products and completed operations liability, blasting and explosion, collapse of structures, underground damage, personal injury liability and contractual liability. The Commercial General Liability Insurance shall provide at minimum the following limits:

<u>Coverage</u>	<u>Limit</u>
.1 General Aggregate	\$ 2,000,000.00 per Project
.2 Products, Completed Operations Aggregate	\$ 2,000,000.00 per Project
.3 Personal and Advertising Injury	\$ 1,000,000.00 per Occurrence
.4 Each Occurrence	\$ 1,000,000.00

(b) Additional Requirements for Commercial General Liability Insurance:

- .1 The policy shall name the Owner, Architect, Alabama Building Commission, State Department of Education (if applicable), and their agents, consultants and employees as additional insureds, state that this coverage shall be primary insurance for the additional insureds; and contain no exclusions of the additional insureds relative to job accidents.
- .2 The policy must include separate per project aggregate limits.

**(3) COMMERCIAL BUSINESS AUTOMOBILE LIABILITY INSURANCE**

(a) Commercial Business Automobile Liability Insurance which shall include coverage for bodily injury and property damage arising from the operation of any owned, non-owned or hired automobile. The Commercial Business Automobile Liability Insurance Policy shall provide not less than \$1,000,000 Combined Single Limits for each occurrence.

(b) The policy shall name the Owner, Architect, Alabama Building Commission, State Department of Education (if applicable), and their agents, consultants, and employees as

additional insureds.

**(4) COMMERCIAL UMBRELLA LIABILITY INSURANCE**

(a) Commercial Umbrella Liability Insurance to provide excess coverage above the Commercial General Liability, Commercial Business Automobile Liability and the Workers' Compensation and Employer's Liability to satisfy the minimum limits set forth herein.

(b) Minimum Combined Primary Commercial General Liability and Commercial/Excess Umbrella Limits of:

.1 \$ 5,000,000 per Occurrence

.2 \$ 5,000,000 Aggregate

(c) Additional Requirements for Commercial Umbrella Liability Insurance:

.1 The policy shall name the Owner, Architect, Alabama Building Commission, State Department of Education (if applicable), and their agents, consultants, and employees as additional insureds.

.2 The policy must be on an "occurrence" basis.

**(5) BUILDER'S RISK INSURANCE**

(a) The Builder's Risk Policy shall be made payable to the Owner and Contractor, as their interests may appear. The policy amount shall be equal to 100% of the Contract Sum, written on a Causes of Loss - Special Form (current edition as of the date of Advertisement for Bids), or its equivalent. All deductibles shall be the sole responsibility of the Contractor.

(b) The policy shall be endorsed as follows:

"The following may occur without diminishing, changing, altering or otherwise affecting the coverage and protection afforded the insured under this policy:

(i) Furniture and equipment may be delivered to the insured premises and installed in place ready for use; or

(ii) Partial or complete occupancy by Owner; or

(iii) Performance of work in connection with construction operations insured by the Owner, by agents or lessees or other contractors of the Owner, or by contractors of the lessee of the Owner."

**C. SUBCONTRACTORS' INSURANCE**

**(1) WORKERS' COMPENSATION and EMPLOYER'S LIABILITY INSURANCE.** The Contractor shall require each Subcontractor to obtain and maintain Workers' Compensation and Employer's Liability Insurance coverages as described in preceding Paragraph B, or to be covered by the Contractor's Workers' Compensation and Employer's Liability Insurance while performing Work under the Contract.

**(2) LIABILITY INSURANCE.** The Contractor shall require each Subcontractor to obtain and maintain adequate General Liability, Automobile Liability, and Umbrella Liability Insurance coverages similar to those described in preceding Paragraph B. Such coverage shall be in effect at all times that a Subcontractor is performing Work under the Contract.

**(3) ENFORCEMENT RESPONSIBILITY.** The Contractor shall have responsibility to enforce its Subcontractors' compliance with these or similar insurance requirements; however, the Contractor shall, upon request, provide the Architect or Owner acceptable evidence of insurance for any Subcontractor.

**D. TERMINATION of OBLIGATION to INSURE**

Unless otherwise expressly provided in the Contract Documents, the obligation to insure as provided herein shall continue as follows:

**(1) BUILDER'S RISK INSURANCE.** The obligation to insure under Subparagraph B(5) shall remain in effect until the Date of Substantial Completion as shall be established in the Certificate of Substantial Completion. In the event that multiple Certificates of Substantial Completion covering designated portions of the Work are issued, Builder's Risk coverage shall remain in effect until the Date of Substantial Completion as shall be established in the last issued Certificate of Substantial Completion. However, in the case that the Work involves separate buildings, Builder's Risk coverage of each separate building may terminate on the Date of Substantial Completion as established in the Certificate of Substantial Completion issued for each building.

**(2) PRODUCTS and COMPLETED OPERATIONS.** The obligation to carry Products and Completed Operations coverage specified under Subparagraph B(2) shall remain in effect for two years after the Date(s) of Substantial Completion.

**(3) ALL OTHER INSURANCE.** The obligation to carry other insurance coverages specified under Subparagraphs B(1) through B(4) and Paragraph C shall remain in effect after the Date(s) of Substantial Completion until such time as all Work required by the Contract Documents is completed. Equal or similar insurance coverages shall remain in effect if, after completion of the Work, the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, returns to the Project to perform warranty or maintenance work pursuant to the terms of the Contract Documents.

**E. WAIVERS of SUBROGATION**

The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents and employees, each of the other, and (2) the Architect, Architect's consultants, separate contractors performing construction or operations related to the Project, if any, and any of their subcontractors, sub-subcontractors, agents and employees, for damages caused by fire or other causes of loss to the extent covered by builder's risk insurance or other property insurance applicable to the Work or to other property located within or adjacent to the Project, except such rights as they may have to proceeds of such insurance held by the Owner or Contractor as fiduciary. The Owner or Contractor, as appropriate, shall require of the Architect, Architect's consultants, separate contractors, if any, and the subcontractor, sub-subcontractors, suppliers, agents and employees of any of them, by appropriate agreements, written where legally required for validity, similar waivers each in favor of other parties enumerated herein. The Policies shall provide such waivers of subrogation by endorsement or otherwise. A waiver of subrogation shall be effective as to the person or entity even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, did not pay the insurance premium directly or indirectly, and whether or not the person or entity had an insurable interest in the property damaged. The waivers provided for in this paragraph shall survive final acceptance and continue to apply to insured losses to the Work or other property on or adjacent to the Project.

## **PERFORMANCE and PAYMENT BONDS**

### **A. GENERAL**

Upon signing and returning the Construction Contract to the Owner for final approval and execution, the Contractor shall, at the Contractor's expense, furnish to the Owner a Performance Bond and a Payment Bond, each in a penal sum equal to 100% of the Contract Sum. Each bond shall be on the form contained in the Project Manual, shall be executed by a surety company (Surety) acceptable to the Owner and duly authorized and qualified to make such bonds in the State of Alabama in the required amounts, shall be countersigned by an authorized, Alabama resident agent of the Surety who is qualified to execute such instruments, and shall have attached thereto a power of attorney of the signing official.

The provisions of this Article are not applicable to this Contract if the Contract Sum is less than \$50,000, unless bonds are required for this Contract in the Supplemental General Conditions.

### **B. PERFORMANCE BOND**

Through the Performance Bond, the Surety's obligation to the Owner shall be to assure the prompt and faithful performance of the Contract and Contract Change Orders. The Penal Sum shall remain equal to the Contract Sum as the Contract Sum is adjusted by Contract Change Orders. In case of default on the part of the Contractor, the Surety shall take charge of and complete the Work in accordance with the terms of the Performance Bond. Any reasonable expenses incurred by the Owner as a result of default on the part of the Contractor, including architectural, engineering, administrative, and legal services, shall be recoverable under the Performance Bond.

### **C. PAYMENT BOND**

Through the Payment Bond the Surety's obligation to the Owner shall be to guarantee that the Contractor and its Subcontractors shall promptly make payment to all persons supplying labor, materials, or supplies for, or in, the prosecution of the Work, including the payment of reasonable attorneys fees incurred by successful claimants or plaintiffs in civil actions on the Bond. Any person or entity indicating that they have a claim of nonpayment under the Bond shall, upon written request, be promptly furnished a certified copy of the Bond and Construction Contract by the Contractor, Architect, Owner, or Alabama Building Commission, whomever is recipient of the request.

### **D. CHANGE ORDERS**

The Penal Sum shall remain equal to the Contract Sum as the Contract Sum is adjusted by Contract Change Orders. All Contract Change Orders involving an increase in the Contract Sum will require consent of Surety by endorsement of the Contract Change Order form. The Surety waives notification of any Contract Change Orders involving only extension of the Contract Time.

### **E. EXPIRATION**

The obligations of the Contractor's performance bond surety shall be coextensive with the contractor's performance obligations under the Contract Documents; provided, however, that the surety's obligation shall expire at the end of the one-year warranty period(s) of Article 35.

### **ARTICLE 39** **ASSIGNMENT**

The Contractor shall not assign the Contract or sublet it as a whole nor assign any moneys due or to become due to the Contractor thereunder without the previous written consent of the Owner (and of the Surety, in the case of a bonded Construction Contract). As prescribed by the Public Works Law, the Contract shall in no event be assigned to an unsuccessful bidder for the Contract whose bid was rejected because the bidder was not a responsible or responsive bidder.

### **ARTICLE 40** **CONSTRUCTION by OWNER or SEPARATE CONTRACTORS**

#### **A. OWNER'S RESERVATION of RIGHT**

(1) The Owner reserves the right to self-perform, or to award separate contracts for, other portions of the Project and other Project related construction and operations on the site. The contractual conditions of such separate contracts shall be substantially similar to those of this Contract, including insurance requirements and the provisions of this Article. If the Contractor considers such actions to involve delay or additional cost under this Contract, notifications and assertion of claims shall be as provided in Article 20 and Article 23.

(2) When separate contracts are awarded, the term "Contractor" in the separate Contract Documents shall mean the Contractor who executes the respective Construction Contract.

#### **B. COORDINATION**

Unless otherwise provided in the Contract Documents, the Owner shall be responsible for coordinating the activities of the Owner's forces and separate contractors with the Work of the Contractor. The Contractor shall cooperate with the Owner and separate contractors, shall participate in reviewing and comparing their construction schedules relative to that of the Contractor when directed to do so, and shall make and adhere to any revisions to the construction schedule resulting from a joint review and mutual agreement.

#### **C. CONDITIONS APPLICABLE to WORK PERFORMED by OWNER**

Unless otherwise provided in the Contract Documents, when the Owner self-performs construction or operations related to the Project, the Owner shall be subject to the same obligations to Contractor as Contractor would have to a separate contractor under the provision of this Article 40.

#### **D. MUTUAL RESPONSIBILITY**

(1) The Contractor shall reasonably accommodate the required introduction and storage of materials and equipment and performance of activities by the Owner and separate contractors and shall connect and coordinate the Contractor's Work with theirs as required by the Contract Documents.

(2) By proceeding with an element or portion of the Work that is applied to or performed on construction by the Owner or a separate contractor, or which relies upon their operations, the Contractor accepts the condition of such construction or operations as being suitable for the Contractor's Work, except for conditions that are not reasonably discoverable by the Contractor. If the Contractor discovers any condition in such construction or operations that is not suitable for the proper performance of the Work, the Contractor shall not proceed, but shall instead promptly notify the Architect in writing of the condition discovered.

(3) The Contractor shall reimburse the Owner for any costs incurred by a separate contractor and payable by the Owner because of acts or omissions of the Contractor. Likewise, the Owner shall be responsible to the Contractor for any costs incurred by the Contractor because of the acts or omissions of a separate contractor.

(4) The Contractor shall not cut or otherwise alter construction by the Owner or a separate contractor without the written consent of the Owner and separate contractor; such consent shall not be unreasonably withheld. Likewise, the Contractor shall not unreasonably withhold its consent allowing the Owner or a separate contractor to cut or otherwise alter the Work.

(5) The Contractor shall promptly remedy any damage caused by the Contractor to the construction or property of the Owner or separate contractors.

#### **ARTICLE 41** **SUBCONTRACTS**

##### **A. AWARD of SUBCONTRACTS and OTHER CONTRACTS for PORTIONS of the WORK**

(1) Unless otherwise provided in the Contract Documents, when delivering the executed Construction Contract, bonds, and evidence of insurance to the Architect, the Contractor shall also submit a listing of Subcontractors proposed for each principal portion of the Work and fabricators or suppliers proposed for furnishing materials or equipment fabricated to the design of the Contract Documents. This listing shall be in addition to any naming of Subcontractors, fabricators, or suppliers that may have been required in the bid process. The Architect will promptly reply to the Contractor in writing stating whether or not the Owner, after due investigation, has reasonable objection to any Subcontractor, fabricator, or supplier proposed by the Contractor. The issuance of the Notice to Proceed in the absence of such objection by the Owner shall constitute notice that no reasonable objection to them is made.

(2) The Contractor shall not contract with a proposed Subcontractor, fabricator, or supplier to whom the Owner has made reasonable and timely objection. Except in accordance with prequalification procedures as may be contained in the Contract Documents, through specified qualifications, or on the grounds of reasonable objection, the Owner may not restrict the Contractor's selection of Subcontractors, fabricators, or suppliers.

(3) Upon the Owner's reasonable objection to a proposed Subcontractor, fabricator, or supplier, the Contractor shall promptly propose another to whom the Owner has no reasonable objection. If the proposed Subcontractor, fabricator, or supplier to whom the Owner made reasonable objection was reasonably capable of performing the Work, the Contract Sum and Contract Time shall be equitably adjusted by Contract Change Order for any resulting difference if the Contractor has acted promptly and responsively in this procedure.

(4) The Contractor shall not change previously selected Subcontractors, fabricators, or suppliers without notifying the Architect and Owner in writing of proposed substitute Subcontractors, fabricators, or suppliers. If the Owner does not make a reasonable objection to a proposed substitute within three working days, the substitute shall be deemed approved.

**B. SUBCONTRACTUAL RELATIONS**

(1) The Contractor agrees to bind every Subcontractor and material supplier (and require every Subcontractor to so bind its subcontractors and material suppliers) to all the provisions of the Contract Documents as they apply to the Subcontractor's and material supplier's portion of the Work.

(2) Nothing contained in the Contract Documents shall be construed as creating any contractual relationship between any Subcontractor and the Owner, nor to create a duty of the Architect, Owner, or Director to resolve disputes between or among the Contractor or its Subcontractors and suppliers or any other duty to such Subcontractors or suppliers.

**ARTICLE 42**  
**ARCHITECT'S STATUS**

- A. The Architect is an independent contractor performing, with respect to this Contract, pursuant to an agreement executed between the Owner and the Architect. The Architect has prepared the Drawings and Specifications and assembled the Contract Document and is, therefore, charged with their interpretation and clarification as described in the Contract Documents. As a representative of the Owner, the Architect will endeavor to guard the Owner against variances from the requirements of the Contract Documents by the Contractor. On behalf of the Owner, the Architect will administer the Contract as described in the Contract Documents during construction and the Contractor's one-year warranty.
- B. So as to maintain continuity in administration of the Contract and performance of the Work, and to facilitate complete documentation of the project record, all communications between the Contractor and Owner regarding matters of or related to the Contract shall be directed through the Architect, unless direct communication is otherwise required to provide a legal notification. Unless otherwise authorized by the Architect, communications by and with the Architect's consultants shall be through the Architect. Unless otherwise authorized by the Contractor, communications by and with Subcontractors and material suppliers shall be through the Contractor.

**C. ARCHITECT'S AUTHORITY**

Subject to other provisions of the Contract Documents, the following summarizes some of the authority vested in the Architect by the Owner with respect to the Construction Contract and as further described or conditioned in other Articles of these General Conditions of the Contract.

- (1) **The Architect is authorized to:**
- (a) approve "minor" deviations as defined in Article 9, Submittals,
  - (b) make "minor" changes in the Work as defined in Article 19, Changes in the Work,
  - (c) reject or require the correction of Defective Work,
  - (d) require the Contractor to stop the performance of Defective Work,
  - (e) adjust an Application for Payment by the Contractor pursuant to Article 30, Certification and Approval of payments, and



(f) issue Notices to Cure pursuant to Article 27.

**(2) The Architect is not authorized to:**

- (a) revoke, alter, relax, or waive any requirements of the Contract Documents (other than “minor” deviations and changes) without concurrence of the Owner,
- (b) finally approve or accept any portion of the Work without concurrence of the Owner,
- (c) issue instructions contrary to the Contract Documents,
- (d) issue Notice of Termination or otherwise terminate the Contract, or
- (e) require the Contractor to stop the Work except only to avoid the performance of Defective Work.

**D. LIMITATIONS of RESPONSIBILITIES**

(1) The Architect shall not be responsible to Contractors or to others for supervising or coordinating the performance of the Work or for the Construction Methods or safety of the Work, unless the Contract Documents give other specific instructions concerning these matters.

(2) The Architect will not be responsible to the Contractor (nor the Owner) for the Contractor’s failure to perform the Work in accordance with the requirements of the Contract Documents or for acts or omissions of the Contractor, a Subcontractor, or anyone for whose acts they may be liable. However, the Architect will report to the Owner and Contractor any Defective Work recognized by the Architect.

(3) The Architect will endeavor to secure faithful performance by Owner and Contractor, and the Architect will not show partiality to either or be liable to either for results of interpretations or decisions rendered in good faith.

(4) The Contractor’s remedies for additional time or expense arising out of or related to this Contract, or the breach thereof, shall be solely as provided for in the Contract Documents. The Contractor shall have no claim or cause of action against the Owner, Architect, or its consultants for any actions or failures to act, whether such claim may be in contract, tort, strict liability, or otherwise, it being the agreement of the parties that the Contractor shall make no claim against the Owner or any agents of the Owner, including the Architect or its consultants, except as may be provided for claims or disputes submitted in accordance with Article 24. The Architect and Architect’s consultants shall be considered third party beneficiaries of this provision of the Contract and entitled to enforce same.

**E. ARCHITECT’S DECISIONS**

Decisions by the Architect shall be in writing. The Architect’s decisions on matters relating to aesthetic effect will be final and binding if consistent with the intent expressed in the Contract Documents. The Architect’s decisions regarding disputes arising between the Contractor and Owner shall be advisory.

**ARTICLE 43  
CASH ALLOWANCES**

- A. All allowances stated in the Contract Documents shall be included in the Contract Sum. Items covered by allowances shall be supplied by the Contractor as directed by the Architect or Owner

and the Contractor shall afford the Owner the economy of obtaining competitive pricing from responsible bidders for allowance items unless other purchasing procedures are specified in the Contract Documents.

- B.** Unless otherwise provided in the Contract Documents:
- (1) allowances shall cover the cost to the Contractor of materials and equipment delivered to the Project site and all applicable taxes, less applicable trade discounts;
  - (2) the Contractor's costs for unloading, storing, protecting, and handling at the site, labor, installation, overhead, profit and other expenses related to materials or equipment covered by an allowance shall be included in the Contract Sum but not in the allowances;
  - (3) if required, the Contract Sum shall be adjusted by Change Order to reflect the actual costs of an allowance.
- C.** Any selections of materials or equipment required of the Architect or Owner under an allowance shall be made in sufficient time to avoid delay of the Work.

#### **ARTICLE 44** **PERMITS, LAWS, and REGULATIONS**

**A. PERMITS, FEES AND NOTICES**

- (1) Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit and other permits and governmental fees, licenses, and inspections necessary for proper execution and completion of the Work which are customarily secured after award of the Construction Contract and which are in effect on the date of receipt of bids.
- (2) The Contractor shall comply with and give notices required by all laws, ordinances, rules, regulations, and lawful orders of public authorities applicable to performance of the Work.

**B. TAXES**

Unless stated otherwise in the Contract Documents, materials incorporated into the Work are exempt from sales and use tax pursuant to Section 40-9-33, Code of Alabama, 1975 as amended. The Contractor and its subcontractors shall be responsible for complying with rules and regulations of the Sales, Use, & Business Tax Division of the Alabama Department of Revenue regarding certificates and other qualifications necessary to claim such exemption when making qualifying purchases from vendors. The Contractor shall pay all applicable taxes that are not covered by the exemption of Section 40-9-33 and which are imposed as of the date of receipt of bids, including those imposed as of the date of receipt of bids but scheduled to go into effect after that date.

**C. COMPENSATION for INCREASES**

The Contractor shall be compensated for additional costs incurred because of increases in tax rates imposed after the date of receipt of bids.

#### **ARTICLE 45** **ROYALTIES, PATENTS, and COPYRIGHTS**

The Contractor shall pay all royalties and license fees. The Contractor shall defend, indemnify and hold harmless the Owner, Architect, Architect's consultants, Alabama Building Commission, State Department of Education (if applicable), and their agents, employees, and consultants from and against all claims, damages, losses and expenses, including but not limited to attorney's fees, arising out of, related to, or resulting from all suits or claims for infringement of any patent rights or copyrights arising out of the inclusion of any patented or copyrighted materials, methods, or systems selected by the Contractor and used during the execution of or incorporated into the Work. This indemnification does not apply to any suits or claims of infringement of any patent rights or copyrights arising out of any patented or copyrighted materials, methods, or systems specified in the Contract Documents. However, if the Contractor has information that a specified material, method, or system is or may constitute an infringement of a patent or copyright, the Contractor shall be responsible for any resulting loss unless such information is promptly furnished to the Architect.

**ARTICLE 46**  
**USE of the SITE**

- A. The Contractor shall confine its operations at the Project site to areas permitted by the Owner and by law, ordinances, permits and the Contract Documents and shall not unreasonably encumber the site with materials, equipment, employees' vehicles, or debris. The Contractor's operations at the site shall be restricted to the sole purpose of constructing the Work, use of the site as a staging, assembly, or storage area for other business which the Contractor may undertake shall not be permitted.
- B. Unless otherwise provided in the Contract Documents, temporary facilities, such as storage sheds, shops, and offices may be erected on the Project site with the approval of the Architect and Owner. Such temporary buildings and/or utilities shall remain the property of the Contractor, and be removed at the Contractor's expense upon completion of the Work, unless the Owner authorizes their abandonment without removal.

**ARTICLE 47**  
**CUTTING and PATCHING**

- A. The Contractor shall be responsible for all cutting, fitting, or patching that may be required to execute the Work to the results indicated in the Contract Documents or to make its parts fit together properly.
- B. Any cutting, patching, or excavation by the Contractor shall be supervised and performed in a manner that will not endanger persons nor damage or endanger the Work or any fully or partially completed construction of the Owner or separate contractors.

**ARTICLE 48**  
**IN-PROGRESS and FINAL CLEANUP**

**A. IN-PROGRESS CLEAN-UP**

- (1) The Contractor shall at all times during the progress of the Work keep the premises and

surrounding area free from rubbish, scrap materials and debris resulting from the Work. Trash and combustible materials shall not be allowed to accumulate inside buildings or elsewhere on the premises. At no time shall any rubbish be thrown from window openings. Burning of trash and debris on site is not permitted.

(2) The Contractor shall make provisions to minimize and confine dust and debris resulting from construction activities.

**B. FINAL CLEAN-UP**

(1) Before Substantial Completion or Final Acceptance is achieved, the Contractor shall have removed from the Owner's property all construction equipment, tools, and machinery; temporary structures and/or utilities including the foundations thereof (except such as the Owner permits in writing to remain); rubbish, debris, and waste materials; and all surplus materials, leaving the site clean and true to line and grade, and the Work in a safe and clean condition, ready for use and operation.

(2) In addition to the above, and unless otherwise provided in the Contract Documents, the Contractor shall be responsible for the following special cleaning for all trades as the Work is completed:

- (a) **Cleaning of all painted, enameled, stained, or baked enamel work:** Removal of all marks, stains, finger prints and splatters from such surfaces.
- (b) **Cleaning of all glass:** Cleaning and removing of all stickers, labels, stains, and paint from all glass, and the washing and polishing of same on interior and exterior.
- (c) **Cleaning or polishing of all hardware:** Cleaning and polishing of all hardware.
- (d) **Cleaning all tile, floor finish of all kinds:** Removal of all splatters, stains, paint, dirt, and dust, the washing and polishing of all floors as recommended by the manufacturer or required by the Architect.
- (e) **Cleaning of all manufactured articles, materials, fixtures, appliances, and equipment:** Removal of all stickers, rust stains, labels, and temporary covers, and cleaning and conditioning of all manufactured articles, material, fixtures, appliances, and electrical, heating, and air conditioning equipment as recommended or directed by the manufacturers, unless otherwise required by the Architect; blowing out or flushing out of all foreign matter from all equipment, piping, tanks, pumps, fans, motors, devices, switches, panels, fixtures, boilers, sanitizing potable water systems; and freeing identification plates on all equipment of excess paint and the polishing thereof.

**C. OWNER'S RIGHT to CLEAN-UP**

If the Contractor fails to comply with these clean-up requirements and then fails to comply with a written directive by the Architect to clean-up the premises within a specified time, the Architect or Owner may implement appropriate clean-up measures and the cost thereof shall be deducted from any amounts due or to become due the Contractor.

**ARTICLE 49**  
**LIQUIDATED DAMAGES**

- A. Time is the essence of the Contract. Any delay in the completion of the Work required by the
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Contract Documents may cause inconvenience to the public and loss and damage to the Owner including but not limited to interest and additional administrative, architectural, inspection and supervision charges. By executing the Construction Contract, the Contractor agrees that the Contract Time is sufficient for the achievement of Substantial Completion.

- B.** The Contract Documents may provide in the Construction Contract or elsewhere for a certain dollar amount for which the Contractor and its Surety (if any) will be liable to the Owner as liquidated damages for each calendar day after expiration of the Contract Time that the Contractor fails to achieve Substantial Completion of the Work. If such daily liquidated damages are provided for, Owner and Contractor, and its Surety, agree that such amount is reasonable and agree to be bound thereby.
- C.** If a daily liquidated damage amount is not otherwise provided for in the Contract Documents, a time charge equal to six percent interest per annum on the total Contract Sum may be made against the Contractor for the entire period after expiration of the Contract Time that the Contractor fails to achieve Substantial Completion of the Work.
- D.** The amount of liquidated damages due under either paragraph B or C, above, may be deducted by the Owner from the moneys otherwise due the Contractor in the Final Payment, not as a penalty, but as liquidated damages sustained, or the amount may be recovered from Contractor or its Surety. If part of the Work is substantially completed within the Contract Time and part is not, the stated charge for liquidated damages shall be equitably prorated to that portion of the Work that the Contractor fails to substantially complete within the Contract Time. It is mutually understood and agreed between the parties hereto that such amount is reasonable as liquidated damages.

#### **ARTICLE 50** **USE of FOREIGN MATERIALS**

- A.** In the performance of the Work the Contractor agrees to use materials, supplies, and products manufactured, mined, processed or otherwise produced in the United States or its territories, if same are available at reasonable and competitive prices and are not contrary to any sole source specification implemented under the Public Works Law.
- B.** In the performance of the Work the Contractor agrees to use steel produced in the United States if the Contract Documents require the use of steel and do not limit its supply to a sole source pursuant to the Public Works Law. If the Owner decides that the procurement of domestic steel products becomes impractical as a result of national emergency, national strike, or other cause, the Owner shall waive this restriction.
- C.** If domestic steel or other domestic materials, supplies, and products are not used in accordance with preceding Paragraphs A and B, the Contract Sum shall be reduced by an amount equal to any savings or benefits realized by the Contractor.
- D.** This Article applies only to Public Works projects financed entirely by the State of Alabama or any political subdivision of the state.

#### **ARTICLE 51**

**PROJECT SIGN**

(Not required for locally-funded SDE projects.)

If the Contract Sum (as awarded) is \$100,000.00 or more, the Contractor shall furnish and erect a project sign as shown in “Detail of Project Sign” (ABC Form C-15) bound in the Project Manual. The project sign shall be erected in a prominent location selected by the Architect and Owner and shall be maintained in good condition until completion of Work. If the Contract involves Work on multiple sites, only one sign is required, which shall be erected on one of the sites in a location selected by the Architect and Owner.

END of  
GENERAL CONDITIONS of the CONTRACT



STATE OF ALABAMA  
**BUILDING COMMISSION**

770 WASHINGTON AVE  
SUITE 444  
Montgomery, Alabama 36130-1150  
Telephone: (334) 242-4082  
Fax: (334) 242-4182

ROBERT BENTLEY  
Governor

Katherine Lynn  
Director

October 1, 2012

**TO: STATE AGENCIES, K-12 SUPERINTENDENTS, COMMUNITY COLLEGES**

**FROM: KATHERINE LYNN, DIRECTOR  
ALABAMA BUILDING COMMISSION** *Katherine Lynn*

**SUBJECT: CHANGES TO WAIVERS OF SUBROGATION CLAUSES**

Upon the recommendation of the Department of Finance, Division of Risk Management, the waivers of subrogation clauses included in the Building Commission's professional services agreements and construction contracts have been modified. The revisions are mandatory for all projects that are or will be insured under the State Insurance Fund. The revised contract clause for ABC Form B-2A, "Standard Articles of the Agreement Between the Owner and Architect" is included in Attachment A. The revised contract clause for ABC Form C-8, "General Conditions of the Construction Contract" is included in Attachment B.

**It is the responsibility of the Owner to ensure that the revised language is incorporated into all professional service agreements and construction contracts. Failure to incorporate the revisions could result in a loss of property coverage by the State Insurance Fund.**

If you should have any questions, please feel free to contact me at (334) 242-4082 or Ben Spillers, Risk Management, at (334) 223-6120.

cc: Mr. Ben Spillers, Risk Management  
Mr. Max Graham, Risk Management  
Dr. Marquita Davis, State Finance Director  
Mr. Richard Cater, Finance Legal  
Mr. Perry Taylor, State School Architect  
Dr. Susan Yvette Price, Acting Chancellor, Department of Postsecondary Education  
Ms. Lynne Thrower, Department of Postsecondary Education  
Mr. Frank Barnes, Department of Postsecondary Education

**ATTACHMENT A**  
**to the**  
**STANDARD ARTICLES of the AGREEMENT BETWEEN OWNER**  
**AND ARCHITECT**

(MANDATORY FOR PROJECTS COVERED THROUGH  
THE STATE INSURANCE FUND (SIF))

1. Article 13 "Architect's Insurance", Paragraph G is modified as follows:

**G. WAIVERS of SUBROGATION**

To the extent ~~damages are that~~ loss or damage is covered by property insurance during construction, the Owner and Architect waive all rights against each other and against the contractors, consultants, agents and employees of the other for damages, except such rights as they may have to proceeds of such insurance held by the Owner, Architect, or Contractor as fiduciary. The Owner or Architect, as appropriate, shall require of the contractors, consultants, agents and employees of any of them similar waivers in favor of the other parties enumerated herein. This waiver shall not be applicable to loss or damage that occurs after final acceptance of the Work.

END of ATTACHMENT A to the  
STANDARD ARTICLES of the AGREEMENT BETWEEN OWNER AND ARCHITECT



**ATTACHMENT B**  
**to the**  
**GENERAL CONDITIONS of the CONTRACT**

(MANDATORY FOR PROJECTS COVERED THROUGH  
THE STATE INSURANCE FUND (SIF))

1. Article 37 "Contractor's and Subcontractors' Insurance", Paragraph E is modified as follows:

**E. WAIVERS of SUBROGATION**

The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents and employees, each of the other, and (2) the Architect, Architect's consultants, separate contractors performing construction or operations related to the Project, if any, and any of their subcontractors, sub-subcontractors, agents and employees, for damages caused by fire or other causes of loss. But said waiver shall apply only to the extent the loss or damage is covered by builder's risk insurance or other property insurance applicable to the Work or to other property located within or adjacent to the Project, except such rights as they may have to proceeds of such insurance held by the Owner or Contractor as fiduciary. The Owner or Contractor, as appropriate, shall require of the Architect, Architect's consultants, separate contractors, if any, and the subcontractor, sub-subcontractors, suppliers, agents and employees of any of them, by appropriate agreements, written where legally required for validity, similar waivers each in favor of other parties enumerated herein. The Policies shall provide such waivers of subrogation by endorsement or otherwise. A waiver of subrogation shall be effective as to the person or entity even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, did not pay the insurance premium directly or indirectly, and whether or not the person or entity had an insurable interest in the property damaged. The waivers provided for in this paragraph shall survive not be applicable to loss or damage that occurs after final acceptance of the Work, and ~~continue to apply to insured losses to the Work or other property on or adjacent to the Project.~~

END of ATTACHMENT B to the  
GENERAL CONDITIONS of the CONTRACT

# SUPPLEMENT to the GENERAL CONDITIONS of the CONTRACT

1. Article 19 "Changes in the Work", Paragraph B (1) is modified as follows:

**(1) Lump Sum.** By mutual agreement to a lump sum based on or negotiated from an itemized cost proposal from the Contractor. Additions to the Contract Sum shall include the Contractor's direct costs plus a maximum 15% markup for overhead and profit. Where subcontract work is involved the total mark-up for the Contractor and a Subcontractor shall not exceed 25%. ~~No allowance for overhead and profit shall be figured on a change which involves a net credit to the Owner.~~ **Changes which involve a net credit to the Owner shall include credits for overhead and profit on the deducted work. Changes involving a net credit that do not include overhead and profit shall be justified by the Architect, approved by the Owner, and must also be approved by the Director.** For the purposes of this method of determining an adjustment of the Contract Sum, "overhead" shall cover the Contractor's indirect costs of the change, such as the cost of bonds, superintendent and other job office personnel, watchman, job office, job office supplies and expenses, temporary facilities and utilities, and home office expenses.

2. Article 19 "Changes in the Work", Paragraph B (3) (f) is modified as follows:

**(3) Force Account.** By directing the Contractor to proceed with the change in the Work on a "force account" basis under which the Contractor shall be reimbursed for reasonable expenditures incurred by the Contractor and its Subcontractors in performing added Work and the Owner shall receive reasonable credit for any deleted Work. The Contractor shall keep and present, in such form as the Owner may prescribe, an itemized accounting of the cost of the change together with sufficient supporting data. Unless otherwise stated in the directive, the adjustment of the Contract Sum shall be limited to the following:

- (a) costs of labor and supervision, including employee benefits, social security, retirement, unemployment and workers' compensation insurance required by law, agreement, or under Contractor's or Subcontractor's standard personnel policy;
- (b) cost of materials, supplies and equipment, including cost of delivery, whether incorporated or consumed;
- (c) rental cost of machinery and equipment, not to exceed prevailing local rates if contractor-owned;
- (d) costs of premiums for insurance required by the Contract Documents, permit fees, and sales, use or similar taxes related to the change in the Work;
- (e) reasonable credits to the Owner for the value of deleted Work, without Contractor or Subcontractor mark-ups; and
- (f) for additions to the Contract Sum, mark-up of the Contractor's direct costs for overhead and profit not exceeding 15% on Contractor's work nor exceeding 25% for Contractor and Subcontractor on a Subcontractor's work. ~~No allowance for overhead and profit shall be figured on a change which involves a net credit to the Owner.~~ **Changes which involve a net credit to the Owner shall include credits for overhead and profit on the deducted work. Changes involving a net credit that do not include overhead and profit shall be justified by the Architect, approved by the Owner, and must also be approved by the Director.**

For the purposes of this method of determining an adjustment of the Contract Sum, "overhead" shall cover the Contractor's indirect costs of the change, such as the cost of insurance other than mentioned above, bonds, superintendent and other job office personnel, watchman, use and rental of small tools, job office, job office supplies and expenses, temporary facilities and utilities, and home office expenses.

END of SUPPLEMENT to the  
GENERAL CONDITIONS of the CONTRACT

## SUPPLEMENTARY GENERAL CONDITIONS

1. The following supplements shall modify, delete and/or add to the General Conditions of the Contract. Where any article, paragraph or subparagraph in the General Conditions is supplemented by one of the following paragraphs, the provisions of such article, paragraph, or subparagraph shall remain in effect and the supplemental provisions shall be considered as added thereto. Where any article, paragraph or subparagraph in the General Conditions is amended, voided or superseded by any of the following paragraphs, the provisions of such article, paragraph or subparagraph not so amended, voided or superseded shall remain in effect.

2. Refer to Article 2.A; Definition:

Architect: Construction documents for this project have been developed by McKee and Associates, Architects, 631 South Hull Street, Montgomery, Alabama, 36104 (334) 834-9933 commissioned by the Owner.

Owner: The Franklin County Board of Education, Russellville, Alabama. Unless otherwise stated, all papers required to be delivered to the Owner shall be forwarded through the Architect.

3. Refer to Article 6;

Add the following to Paragraph B:

The lowest bidding Contractor shall submit to the Architect within five (5) calendar days after the bid date the name(s) of the Superintendent(s) who will be in charge at the work site, along with the qualifications and experience.

NOTE: By submission of a Proposal the Bidder agrees that the Owner or Architect may reject a proposed Superintendent with or without a stated reason with no recourse to the Contractor.

4. Refer to Article 6;

Add the following to Paragraph C:

All labor shall be performed in the best and most workmanlike manner by persons skilled in their respective assignments or trades. Workmen whose work is unsatisfactory to the Architect or the Owner, or who are considered unfit or unskilled, or otherwise objectionable, shall be dismissed upon notice from the Architect or Owner.

5. Refer to Article 9, Paragraph D;

Add the following:

**All submittals for color selections, to be made by the Architect for the entire project shall be submitted at the same time within 45 days from the "Notice to Proceed". Piece-meal submittals for color selection will not be permitted.**

**Provide as follows unless otherwise specified:**

- a. **All submittals shall be sent to the Architect no later than 45 calendar days from "Notice To Proceed" to [andersong@mckeeassoc.com](mailto:andersong@mckeeassoc.com).**
- b. **Submittals regarding mechanical, plumbing, electrical and structural items shall be sent directly to the Engineer of record (see cover sheet of the specification for address). A digital copy of the transmittal shall be sent to the Architect at the following email address: [andersong@mckeeassoc.com](mailto:andersong@mckeeassoc.com)**

6. Refer to Article 13;

Add the following:

"If the bidder desires to substitute an "equal", he must secure written approval by the Architect of qualification to bid ten (10) days prior to date.

On all items specified as or equal substitutions must be submitted to the Architect ten (10) days prior to bid opening and Architect will act on substitution five (5) days prior to bids and notify all Contractors.

7. Refer to Article 32, SUBSTANTIAL COMPLETION

Add the following:

All manufactures warranties shall commence on the date as set forth on the Substantial Completion Form, no exceptions.

Contractor shall furnish to the Architect a written letter of "notification" that all "Punch List" items have been completed prior to re-inspection.

8. Refer to Article 35, paragraph “D”, Special Warranties:

Change as follows:

- (1) The Contractor shall deliver to the Owner through the Architect all special or extended warranties required by the Contract Documents from the Contractor, Subcontractors, and suppliers.

9. Refer to Article 37:

The Architect shall not be liable for any damage or injury to property or any person or persons arising from the presence of/or effects of any hazardous materials or hazardous elements in any state of form in connection with the work under this Contract. All such liability shall lie with the Contractor.

10. Refer to Article 44:

Add the following: All work on this project shall be performed in accordance with the following codes:

2015 International Building Code  
2015 International Plumbing Code  
2015 International Mechanical Code  
2015 International Fuel Gas Code  
2015 International Fire Code  
2014 National Electrical Code  
2013 National Fire Alarm and Signaling Code  
2014 ACC/NSSA Standard For The Design and Construction of Storm Shelters  
ANSI/ASHRAE/IESNA Standard 90.1-2013 Energy Standard for Buildings  
Except Low-Rise Residential  
2010 ADA Standards For Accessible Design

11. Refer to Article 49:

**Liquidated damages will be assessed at a rate of 6% per annum.**

12. If this contract extends thirty (30) days past Schedule Completion Date, Owner shall deduct from the Contractor's final payment, a sum equal to the additional expense incurred by the Owner for the Architect for contract administration past scheduled completion date.
13. Prior to final acceptance by the Owner, the Contractor shall furnish a letter to the Owner, certifying that the material used on this project contained no asbestos.

# APPLICATION and CERTIFICATE for PAYMENT

Attach Schedule of Values

ESTIMATE No. \_\_\_\_\_

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

B.C. No. \_\_\_\_\_

TO OWNER:	PROJECT
FROM CONTRACTOR:	FROM ARCHITECT
FEIN _____	

TOTAL ORIGINAL CONTRACT  
CHANGE ORDER(S) Numbers \_\_\_\_\_ through \_\_\_\_\_  
TOTAL CONTRACT TO DATE

\$ \_\_\_\_\_  
\$ \_\_\_\_\_  
\$ \_\_\_\_\_

1. Work Completed to Date per attached Schedule of Values ( \_\_\_\_\_ %)
2. Stored Materials: *(Attach list or Form ABC C - SM, Inventory of Stored Materials.)*
3. Total Completed Work and Stored Materials
4. Less Retainage
5. Total Due
6. Less Total Previous Payments
7. Balance Due This Estimate

\$ \_\_\_\_\_  
\$ \_\_\_\_\_  
\$ \_\_\_\_\_  
\$ \_\_\_\_\_  
\$ \_\_\_\_\_  
\$ \_\_\_\_\_  
\$ \_\_\_\_\_

## CONTRACTOR'S CERTIFICATION

The undersigned Contractor certifies that to the best of his knowledge, information, and belief the Work covered by this Application for Payment has been completed in accordance with the Contract Documents, that all amounts have been paid by him for Work for which previous Certificates for Payments were issued and payments received from the Owner and that current payment shown herein has not yet been received.

By \_\_\_\_\_ Date \_\_\_\_\_

(Title)

Sworn and subscribed before me this \_\_\_\_\_ day of \_\_\_\_\_

\_\_\_\_\_, L. S.

Notary Public

## ARCHITECT'S CERTIFICATION

In accordance with the Contract Documents, the Architect certifies to the Owner that, to the best of the Architect's knowledge and belief, the Work has progressed to the point indicated herein, the quality of the Work is in accordance with the Contract Documents, and the Contractor is entitled to payment of the amount approved.

\_\_\_\_\_  
(Architect)

By \_\_\_\_\_

Date \_\_\_\_\_

## APPROVALS

Approved by \_\_\_\_\_ Date \_\_\_\_\_  
(Owner) Signature

Approved by \_\_\_\_\_ Date \_\_\_\_\_  
Signature

<b>PROGRESS SCHEDULE AND REPORT</b>		<b>CONTRACTOR:</b>	DATE OF REPORT
<b>PROJECT</b>		<b>ARCHITECT:</b>	PROCEED DATE
<b>B. C. No.</b>			PROJECTED COMPLETION DATE

WORK DIVISION	%	AMOUNT														
1. GENERAL REQUIREMENTS																
2. SITEWORK																
3. CONCRETE																
4. MASONRY																
5. METALS																
6. WOOD AND PLASTIC																100%
7. THERMAL AND MOISTURE PROTECTION																90%
8. DOORS AND WINDOWS																80%
9. FINISHES																70%
10. SPECIALTIES																60%
11. EQUIPMENT																50%
12. FURNISHINGS																40%
13. SPECIAL CONSTRUCTION																30%
14. CONVEYING SYSTEMS																20%
15. MECHANICAL																10%
16. ELECTRICAL																0%
TOTAL ORIG. CONTRACT	100%															
ANTICIPATED DRAW IN \$1,000																
ACTUAL DRAW IN \$1,000																



USE ADDITIONAL SHEETS IF JOB IS  
SCHEDULED MORE THAN 12 MONTHS



**LEGEND:** ANTICIPATED ACTIVITY   ACTUAL ACTIVITY   ANTICIPATED CASH FLOW   ACTUAL CASH FLOW

# CONTRACT CHANGE ORDER

Change Order No. \_\_\_\_\_ Date \_\_\_\_\_ B.C.No. \_\_\_\_\_

<b>TO:</b> <i>(Contractor)</i>	<b>PROJECT:</b>
--------------------------------	-----------------

TERMS: You are hereby authorized, subject to the provisions of your Contract for this project, to make the following changes thereto in accordance with your proposal(s) dated \_\_\_\_\_

FURNISH the necessary labor, materials, and equipment to *(Description of work to be done or changes to be made.)*

ORIGINAL CONTRACT SUM \$ \_\_\_\_\_  
NET TOTAL OF PREVIOUS CHANGE ORDERS \$ \_\_\_\_\_  
PREVIOUS REVISED CONTRACT SUM \$ \_\_\_\_\_  
THIS CHANGE ORDER WILL ☐ INCREASE ☐ DECREASE  
THE CONTRACT SUM BY \$ \_\_\_\_\_  
REVISED CONTRACT SUM, INCLUDING THIS CHANGE ORDER \$ \_\_\_\_\_

EXTENSION OF TIME resulting from this Change Order \_\_\_\_\_ *(Insert "None" or No. of days)*

The Owner does hereby certify that this Change Order was executed in accordance with the provisions of Title 39, Code of Alabama, 1975, as amended.

## CONSENT OF SURETY

## CONTRACTING PARTIES

\_\_\_\_\_  
(Company)  
By \_\_\_\_\_ Contractor  
(Attach current Power of Attorney)  
Name & Title \_\_\_\_\_

## RECOMMENDED

By \_\_\_\_\_  
Architect

## APPROVALS

### STATE OF ALABAMA BUILDING COMMISSION

*(Not required for locally-funded SDE projects)*

\_\_\_\_\_  
(Awarding Authority)

By \_\_\_\_\_  
Director, Technical Staff  
By \_\_\_\_\_  
Name & Title \_\_\_\_\_

By \_\_\_\_\_

TO: **STATE OF ALABAMA**  
**BUILDING COMMISSION**  
770 Washington Avenue, Suite 444  
Montgomery, AL 36130-1150  
(334) 242-4082 FAX (334) 242-4182

# CERTIFICATE OF SUBSTANTIAL COMPLETION

**ROUTING PROCEDURES** ON REVERSE SIDE

**BC#** \_\_\_\_\_

<b>OWNER(S):</b>	<b>ARCHITECT:</b> McKee & Associates Architects & Interior Design 631. South Hull St. Montgomery, Al 36104
<b>CONTRACTOR:</b>	<b>BONDING COMPANY:</b>
<b>PROJECT</b>	

**Substantial Completion** has been achieved for ☐ the entire Work ☐ the following portion of the Work \_\_\_\_\_

The **Date of Substantial Completion** of the Work covered by this certificate is established to be \_\_\_\_\_.

"Substantial Completion" means the designated Work is sufficiently complete, in accordance with the Contract Documents, such that the Owner may occupy or utilize the Work for its intended use without disruption or interference by the Contractor in completing or correcting any remaining unfinished Work. The Date of Substantial Completion is the date upon which all warranties for the designated Work commence, unless otherwise agreed and recorded herein.

**Punch List:** A \_\_\_\_\_ page list of items to be completed or corrected prior to the Owner's approval of Final Payment is attached hereto, but does not alter the Contractor's responsibility to complete or correct all Work in full compliance with the Contract Documents. The Contractor shall complete or correct all items on the attached list, ready for re-inspection for Final Acceptance, within 30 days after the above Date of Substantial Completion, unless another date is stated here: \_\_\_\_\_. If completed or corrected within this period, warranties of these items commence on the Date of Substantial Completion, otherwise such warranties commence on the date of Final Acceptance of each item.

**Only one (1) originally executed substantial completion form should be routed for signature. B.C. office will forward the original to the Owner and provide copies to all other parties.**

<b>RECOMMENDED BY:</b>	
ARCHITECT: _____	DATE: _____
<b>CONTRACTING PARTIES:</b>	
CONTRACTOR _____	DATE: _____
OWNER _____	DATE: _____
	DATE: _____
<b>APPROVALS:</b>	
BUILDING COMM.INSPECTOR: _____	DATE: _____
BUILDING COMM. CHIEF INSPECTOR: _____	DATE: _____
BUILDING COMM. DIRECTOR: _____	DATE: _____

This form is mandatory and must be attached to all Certificates of Substantial Completion for all new K-12 public schools awarded after July 1, 2010.

B.C. # \_\_\_\_\_

## CERTIFICATION OF STRUCTURAL OBSERVATIONS

for

Project Name \_\_\_\_\_

Owner \_\_\_\_\_

Contractor \_\_\_\_\_

I, \_\_\_\_\_, do hereby verify that I have personally  
Design Professional

conducted the visual observations of the construction of the structural system for conformance to the approved construction documents for the referenced project. The visual observations of the structural systems were personally conducted by me at all significant construction stages and at the completion of the construction of the structural system. To the best of my knowledge, all structural deficiencies have been resolved except as noted below:

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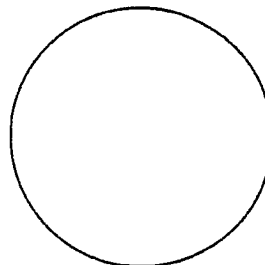
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Signed and sealed on this date, \_\_\_\_\_, 20\_\_\_\_.

\_\_\_\_\_  
Architect or Structural Engineer of Record



Design Professional's Seal

## FORM OF ADVERTISEMENT FOR COMPLETION

### LEGAL NOTICE

In accordance with Chapter 1, Title 39, Code of Alabama, 1975, notice is hereby given  
that \_\_\_\_\_,

*(Contractor)*

Contractor, has completed the Contract for (Construction) (Renovation) (Alteration) (Equipment)  
(Improvement) of \_\_\_\_\_  
*(Name of Project)*

at \_\_\_\_\_

*(Insert location data in County or City)*

for the State of Alabama and the (County) (City) of \_\_\_\_\_, Owner(s), and  
have made request for final settlement of said Contract. All persons having any claim for labor,  
materials, or otherwise in connection with this project should immediately notify

\_\_\_\_\_  
\_\_\_\_\_*(Architect)*

\_\_\_\_\_  
*(Contractor)*

\_\_\_\_\_  
*(Business Address)*

NOTE: This notice must be run once a week for four successive weeks for projects exceeding  
\$50,000.00, for projects of less than \$50,000.00, run one time only. Proof of  
publication is required.

## GENERAL CONTRACTOR'S ROOFING GUARANTEE

B. C. Project No. \_\_\_\_\_  
\_\_\_\_\_

Project Name & Address	Project Owner(s) & Address

General Contractor's Name, Address, & Telephone Number	<b>EFFECTIVE DATES OF GUARANTEE</b>
	Date of Acceptance:
	Date of Expiration:

1. The General Contractor does hereby certify that the roofing work included in this contract was installed in strict accordance with all requirements of the plans and specifications and in accordance with approved roofing manufacturers recommendations.
2. The General Contractor does hereby guarantee the roofing and associated work including but not limited to all flashing and counter flashing both composition and metal, roof decking and/or sheathing; all materials used as a roof substrate or insulation over which roof is applied; promenade decks or any other work on the surface of the roof; metal work; gravel stops and roof expansion joints to be absolutely watertight and free from all leaks, due to faulty or defective materials and workmanship for a period of five (5) years, starting on the date of substantial completion of the project. This guarantee does not include liability for damage to interior contents of building due to roof leaks, nor does it extend to any deficiency which was caused by the failure of work which the general contractor did not damage or did not accomplish or was not charged to accomplish.
3. Subject to the terms and conditions listed below, the General Contractor also guarantees that during the Guarantee Period he will, at his own cost and expense, make or cause to be made such repairs to, or replacements of said work, in accordance with the roofing manufacturers standards as are necessary to correct faulty and defective work and/or materials which may develop in the work including, but not limited to: blisters, delamination, exposed felts, ridges, wrinkles, splits, warped insulation and/or loose flashings, etc. in a manner pursuant to the total anticipated life of the roofing system and the best standards applicable to the particular roof type in value and in accordance with construction documents as are necessary to maintain said work in satisfactory condition, and further, to respond on or within three (3) calendar days upon proper notification or leaks or defects by the Owner or Architect.

- A. Specifically excluded from this Guarantee are damages to the work, other parts of the building and building contents caused by: (1) lightning, windstorm, hailstorm and other unusual phenomena of the elements; and (2) fire. When the work has been damaged by any of the foregoing causes, the Guarantee shall be null and void until such damage has been repaired by the General Contractor, and until the cost and expense thereof has been paid by the Owner or by the responsible party so designated.
- B. During the Guarantee Period, if the Owner allows alteration of the work by anyone other than the General Contractor, including cutting, patching and maintenance in connection with penetrations, and positioning of anything on the roof, this Guarantee shall become null and void upon the date of said alterations. If the owner engages the General Contractor to perform said alterations, the Guarantee shall not become null and void, unless the General Contractor, prior to proceeding with the said work, shall have notified the Owner in writing, showing reasonable cause for claim that said alterations would likely damage or deteriorate the work, thereby reasonably justifying a termination of this Guarantee.
- C. Future building additions will not void this guarantee, except for that portion of the future addition that might affect the work under this contract at the point of connection of the roof areas, and any damage caused by such addition. If this contract is for roofing of an addition to an existing building, then this guarantee covers the work involved at the point of connection with the existing roof.
- D. During the Guarantee period, if the original use of the roof is changed and it becomes used for, but was not originally specified for, a promenade, work deck, spray cooled surface, flooded basin, or other use of service more severe than originally specified, this Guarantee shall become null and void upon the date of said change.
- E. The Owner shall promptly notify the General Contractor of observed, known or suspected leaks, defects or deterioration, and shall afford reasonable opportunity for the General Contractor to inspect the work, and to examine the evidence of such leaks, defects or deterioration.

IN WITNESS THEREOF, this instrument has been duly executed this \_\_\_\_\_ day of \_\_\_\_\_, 20 \_\_\_\_\_.

---

General Contractor's Authorized Signature

---

Typed Name and Title

## SECTION 01010 - SCOPE OF THE WORK

### PART 1 – GENERAL

#### RELATED DOCUMENTS AND GENERAL INFORMATION:

Drawings and general provisions of the Contract including General and Supplementary Conditions and other Division 1 specification sections apply to the work of this section.

#### SUMMARY

This Section includes the following:

1. Type of the Contract.
2. Building Commission User Fees.
3. Work under other contracts.
4. Owner-furnished products.
5. Use of premises.
6. Owner's occupancy requirements.
7. Work restrictions.
8. Specification formats and conventions.

Related Sections include the following:

1. Division 1 Section 01500 "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.

#### BUILDING COMMISSION USER FEES

See the attached Memorandum From The State of Alabama Building Commission dated September 29, 2014 regarding Administrative Rule 170X-8 Collection Of User Fees now in effect.

1. **The General Contractor shall include in his Base Bid Proposal all "Permit" and any "Inspection" fees addressed as stated in this memorandum.**
2. **Do not include the "Plan Review Fee" or the "Contract Administration Fee" in your Proposal.**



## PROJECT / WORK IDENTIFICATION:

General: Project name is as indicated in the Advertisement For Bids and as shown on the Contract Documents prepared by McKee & Associates, 631 S. Hull Street Montgomery, Alabama 36104.

Contract Documents: Indicate the work of the Contract and related requirements and conditions that have an impact on the project. Related requirements and conditions that are indicated on the Contract Documents include, but are not limited to the following:

1. Existing site conditions and restrictions on use of the site including ingress and egress to the site.
2. Grading operations at the site.
3. The Contractor shall be responsible to secure the site during the execution of the work and provide proof of insurance including but not limited to General Liability, W/C, Auto, Equipment, Etc.

Summary by References: Work of the Contract can be summarized by references to the Contract, General Conditions, Supplementary Conditions, the Project Manual, Technical Specification Sections, Drawings, Addenda and modifications to the Contract Documents issued subsequent to the initial printing of this Project Manual and the Drawings, and including but not necessarily limited to, printed material referenced by any of the above. It is recognized that the Work of the Contract is also unavoidably affected or influenced by governing regulations, natural phenomenon including weather conditions, and other forces outside the contract documents.

## SUPERVISION:

Supervision: The Contractor shall provide adequate supervision of the project to ensure proper supervision for all work.

## CONTRACTOR USE OF PREMISES:

General: During the entire cleanup period the Contractor shall have the exclusive use of the premises for cleanup operations, including full use of the site as shown on the Drawings.

1. Limitations of exclusive use of the site:
  - a. Confine operations at the site to the areas permitted under the Contract. Portions of the site beyond areas on which work is indicated are not to be disturbed. Conform to applicable rules and regulations affecting the work while engaged in project performance. See site plan for ingress and egress to the site, or if not indicated, same shall be as designated by the Architect.

- b. Keep existing public roads, driveways and entrances serving the premises clear and available at all times. Do not use these areas for parking or storage of materials. Remove dirt, mud, debris, etc., from site, sidewalks, streets, and public right-of-way as it occurs.
- c. Do not unreasonably encumber the site with materials or equipment. Confine stockpiling of materials and location of storage sheds and or designated storage areas as indicated.
- d. Lock automotive type vehicles, such as passenger cars and trucks and other mechanized or motorized construction equipment, when parked and unattended, so as to prevent unauthorized use. Do not leave such vehicles or equipment unattended with the motor running or the ignition key in place.
- e. The Owner, and their representatives, the Architect and their Consultants, as well as authorities having jurisdiction will require site accessibility for inspections, observations, and perhaps other purposes, related to the planned new construction. All Contractors shall assist in such accessibility, to at least the point of providing and maintaining accessible dry paths to work in progress.
- f. Furnish and install by contractor temporary barricades, fencing, etc., as indicated or otherwise required, to restrict pedestrian and vehicular traffic from construction operations, including in part, Owner's staff, the public, students, children, and residents of the adjacent residential neighborhoods.
- g. Construction operations shall not effect in any manner, the on-going operations of the Owner, immediately adjacent facilities, adjacent property owners or businesses, or others. Refer to Division 1 Section "Special Conditions" for additional information and requirements regarding coordination with Owner's activities, etc.
- h. Construction equipment shall not come in contact with or swing over existing facilities to remain, public areas, occupied buildings, right-of-ways, etc., which are to remain.
- i. All contractors and their employees shall limit any discussion of the Work of this project to the Owner's representatives named in the front of this Project Manual, Consultants employed, inspecting authorities with jurisdiction, and the Architect. In no instance shall this project be discussed with others, except as may otherwise be indicated herein.
- j. Parking on-site, if any, shall be limited to the "staging areas" indicated on the Drawings, or if not indicated, as mutually agreed between the Architect and Contractor at the Pre-Construction Conference.
- k. Smoking or other use of tobacco products shall not be permitted within the structure of the Building, Owner's facilities or on roofs.

- l. The use or presence of alcohol and/or other debilitating substances shall not be permitted in the construction of the building and or on the project site.
- m. Firearms and/or other weapons shall not be permitted on the project site.
- n. The Contractor shall furnish necessary temporary toilets for all work forces on the job site”.

## PART 2 - SCOPE OF THE WORK:

The Scope of the Work of the Contract is meant to be viewed as a successor to the General Special Conditions of the Contract. Should any discrepancy or ambiguity be noted, the Scope of the Work of the Contract shall apply and the General Special Conditions of the Contract shall defer to Scope of the Work of the Contract Documents. The scope of the work shall be taken in its entirety by all contractors. In signing the contract all contractors have read and understand that the Scope of the Work and the General Special Conditions are taken in their entirety.

**The term "Design Consultant" shall be construed to mean "Architect". The terms, "Owner", shall mean "Cherokee County Board Of Education".**

## WORK UNDER OTHER CONTRACTS

General: Cooperate fully with separate contractors so work on those contracts may be carried out smoothly, without interfering with or delaying work under this Contract. Coordinate the Work of this Contract with work performed under separate contracts.

Concurrent Work: Owner will award separate contract(s) for the following construction operations at the Project site. Those operations will be conducted simultaneously with work under this Contract.

- 1. Work done by others or by Owner.
  - a. Any items noted N.I.C.
  - b. Construction Testing as defined in Section 01400 Quality Requirements.

## BUILDING AND SITE CONSTRUCTION:

The Contractor shall maintain the entire site, provide dust control and keep the streets clean at all times and or as directed by the Architect.

- 1. The Contractor shall call for and be responsible for the locating of all utilities prior to start of work. Use extreme care when working in close proximity to the existing water lines to prevent movement and damage to the water lines.

2. The Contractor shall install and or replace all fencing including furnish and install all temporary fencing as required for all work including safety barriers, signs, traffic directional signals, temporary stripping, flagman, temporary road plates and any temporary roads around any obstruction and or work being constructed. The Contractor shall make all provisions to keep the public and or temporary access roads open during the duration of the work.
3. The Contractor shall maintain & level, all temporary roads and temporary lay down and storage areas using same stone base material. Roads must have no potholes, dips, or rises and provide access to and from the site and other locations on site. The Contractor shall maintain the temporary roads used to move material on the site. Temporary roads are existing and the Contractor shall maintain these temporary roads throughout the duration of construction activity while Contractor is onsite.

#### GENERAL ISSUES:

1. The Contractor shall be responsible for their own on-site safety requirements within the site per OSHA regulations.
2. Only an approved company owned and insured vehicle shall be allowed on to the construction site. Vehicles shall be clearly marked and identified with the company logo and or name.

#### TEMPORARY ELECTRICAL POWER AND JOBSITE UTILITIES:

1. The Contractor is responsible for the all costs associated with temporary electrical requirements for performance of the work. The Contractor shall be responsible for the all costs associated with temporary water required for the performance of the work. The Contractor is responsible for all other utility costs as required for the performance of the work.

#### SITE SECURITY / INSURANCE REQUIREMENTS:

1. The Contractor shall have care custody and control of the site. Contractor shall be responsible for the replacement of their material, equipment and any loss of such. Contractor shall be responsible for securing all material and equipment. If there is a loss and or damage of material and equipment, that loss shall go against the Contractor's insurance coverage.

#### PROTECTION OF WORK IN PLACE:

1. The Contractor shall protect all completed work and any rework shall be the responsibility of the contractor at no additional cost to the owner.

## WORK RESTRICTIONS

Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:

1. Notify Architect and Owner not less than two days in advance of the proposed utility interruptions.
2. Do not proceed with utility interruptions without Architect's and Owner's written permission.

Nonsmoking Building: Smoking and smokeless tobacco will not be permitted within the new construction after floor slabs are poured.

## OWNER'S OCCUPANCY REQUIREMENTS

Owner Occupancy: Owner will occupy adjacent parking lots during entire construction period. Cooperate with Owner during construction operations adjacent to or near the existing building and parking to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's day-to-day operations. Maintain existing exits, unless otherwise indicated.

Maintain access to existing walkways and other adjacent occupied or used facilities. Do not close or obstruct walkways or other occupied or used facilities without written permission from Owner and authorities having jurisdiction. Provide not less than 72 hours' notice to Owner of activities that will affect Owner's operations.

Owner Occupancy of Completed Areas of Construction: Owner reserves the right to place and install equipment in completed areas of building, before Substantial Completion, provided such does not interfere with completion of the Work. Such placement of equipment shall not constitute acceptance of the total Work.

## SPECIFICATION FORMATS AND CONVENTIONS

Specification Format: The Specifications are organized into Divisions and Sections using the 16-division format numbering system.

1. Section Identification: The Specifications use Section numbers and titles to help cross-referencing in the Contract Documents. Sections in the Project Manual are in numeric sequence; however, the sequence is incomplete because all available Section numbers are not used. Consult the table of contents at the beginning of the Project Manual to determine numbers and names of Sections in the Contract Documents.

Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:

1. Abbreviated Language: Language used in the Specifications another Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be inferred as the sense requires. Singular words shall be interpreted as plural, and plural words shall be interpreted as singular where applicable as the context of the Contract Documents indicates.
2. Imperative mood and streamlined language are generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by Contractor. Occasionally, the indicative or subjunctive mood may be used in the Section Text for clarity to describe responsibilities that must be fulfilled indirectly by Contractor or by others when so noted.
  - a. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.

END OF SECTION 01010

## SECTION 01011 – CONTINGENCY ALLOWANCE

The General Contractor shall include in his bid proposal the following sums:

1. The General Contractor shall include in his Base Bid Proposal **Ten Thousand Dollars (\$ 10,000.00)** as a contingency to cover unforeseen conditions or minor changes that are necessary to correct or supplement the work as detailed in the Contract Documents.
2. The General Contractor shall include in his Base Bid Proposal **Three Thousand Dollars (\$ 3,000.00)** as an allowance for exterior building lettering/signage.

The Contractor shall include in his bid proposal all costs of office, job supervision, overhead, profit, and bond on this Contingency Allowance, because no such costs will be paid to Contractor for work performed under this Contingency Allowance. Only the direct costs of performing work under this provision shall be paid under and charged against the Contingency Allowance; such cost includes costs of materials and delivery, installation labor, payroll taxes and insurance, equipment expense, and the cost of subcontracted work (subcontractor's cost may include a maximum of 15% mark-up for overhead and profit).

After unknown conditions are identified and examined and the scope of work and method of repair determined, or request for a proposal to cover additional work has been issued by the Owner, the Contractor shall submit a proposal for such work to the Architect for the Owner's approval. If the Owner approves of such proposal, he will issue written authorization to the Contractor to perform the work and charge the related costs to the Contingency Allowance. At the Owner's option, work performed under this provision may be ordered done on a time and material basis, in which case; the Contractor shall keep accurate records of all time and materials used and submit such records to the Architect for his approval at the end of each day's work.

An accounting of the costs charged against this Contingency Allowance shall be mutually maintained by the Contractor, Architect, and Owner throughout the course of the project. Any of this Contingency Allowance not spent shall be credited to the Owner by Change Order at close out of the project, refer to Contingency Allowance Form attached to this Section.

Provide for payment.

The Contractor shall include a line item in the Schedule of Values entitled "Contingency Allowance" with a scheduled value of **\$ 13,000.00**. The estimated value of work completed pursuant to fully executed Contingency Allowance Authorizations may be included in the Contractor's monthly Applications for Payment. Payments under this

Contingency Allowance shall not exceed the net, total of fully executed Contingency Allowance Authorizations.

**A SCIENCE AND BAND BUILDING  
AT  
VINA HIGH SCHOOL  
FOR  
THE FRANKLIN COUNTY BOARD OF EDUCATION  
RUSSELLVILLE, ALABAMA**

**Project No. 18-144      BC Project No. \_\_\_\_\_**

**CONTINGENCY ALLOWANCE AUTHORIZATION**

AUTHORIZATION No. \_\_\_\_\_ DATE \_\_\_\_\_

In accordance with Specification Section 01011 – CONTINGENCY ALLOWANCE, the Contractor \_\_\_\_\_, is hereby authorized to proceed with the changes in Work as are described below and is to be paid for the performance of these changes as provided in Specification Section 01011. This Authorization shall become effective when it is signed by the Contractor and the Owner's representative and it is understood and agreed that the amount(s) stipulated below constitute full compensation for these changes in Work.

TOTAL AMOUNT OF THIS AUTHORIZATION \$ \_\_\_\_\_

ORIGINAL AMOUNT OF THE CONTINGENCY ALLOWANCE \$ \_\_\_\_\_

NET TOTAL OF PREVIOUS AUTHORIZATIONS \$ \_\_\_\_\_

PREVIOUS REMAINING CONTINGENCY ALLOWANCE \$ \_\_\_\_\_

TOTAL AMOUNT OF THIS AUTHORIZATION \$ \_\_\_\_\_

CONTINGENCY ALLOWANCE REMAINING  
AFTER THIS CONTINGENCY \$ \_\_\_\_\_

Recommended By:

Authorized By:

Accepted By:

\_\_\_\_\_  
Architect  
END OF SECTION 01011

\_\_\_\_\_  
Franklin County B.O.E.

\_\_\_\_\_  
Contractor



## SECTION 01250 - CONTRACT MODIFICATION PROCEDURES

### PART 1 – GENERAL

#### RELATED DOCUMENTS

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

#### SUMMARY

This Section specifies administrative and procedural requirements for handling and processing Contract modifications.

Related Sections include the following:

1. Section 01600 "Product Requirements" for administrative procedures for handling requests for substitutions made after Contract award.

#### MINOR CHANGES IN THE WORK

Architect will issue supplemental instructions authorizing Minor Changes in the Work, that may or may not involve an adjustment to the Contract Sum or the Contract Time, as an Architect's Supplemental Instructions, "ASI".

#### PROPOSAL REQUESTS

Owner-Initiated Proposal Requests: Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time in the form of an ASI. If necessary, the description will include supplemental or revised Drawings and Specifications.

1. ASIs issued by Architect, if adjustments to contract sum or contract time are involved, are for information only. Do not consider them instructions either to stop work in progress or to execute the proposed change.
2. Within time specified in ASI after receipt of ASI, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
  - a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.

- b. Indicate applicable delivery charges, equipment rental, and amounts of trade discounts.
- c. Include costs of labor and supervision directly attributable to the change.
- d. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
- e. Include data as needed to validate material costs

Contractor-Initiated Proposals: If latent or unforeseen conditions require modifications to the Contract, Contractor may propose changes by submitting a request for a change to Architect.

- 1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
- 2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
- 3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
- 4. Include costs of labor and supervision directly attributable to the change.
- 5. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
- 6. Comply with requirements in Division 1 Section "Product Requirements" if the proposed change requires substitution of one product or system for product or system specified.

### CHANGE ORDER PROCEDURES

On Owner's approval of a Change Order, Architect will issue a Change Order for signatures as required.

### CONSTRUCTION CHANGE DIRECTIVE

Construction Change Directive, "CCD": Architect may issue a Construction Change Directive. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.

1. Construction Change Directive contains a complete description of change in the Work.

END OF SECTION 01250

## SECTION 01290 - PAYMENT PROCEDURES

### PART 1 – GENERAL

#### RELATED DOCUMENTS

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

#### SUMMARY

This Section specifies administrative and procedural requirements necessary to prepare and process Applications for Payment.

Related Division 1 Sections include the following:

1. Section 01320 "Construction Progress Documentation" for administrative requirements governing preparation and submittal of Contractor's Construction Schedule and Submittals Schedule.

#### DEFINITIONS

Schedule of Values: A statement furnished by Contractor allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

#### SCHEDULE OF VALUES

Coordination: Coordinate preparation of the Schedule of Values with preparation of Contractor's Construction Schedule.

1. Correlate line items in the Schedule of Values with other required administrative forms and schedules, including the following:
  - a. Application for Payment forms with Continuation Sheets.
  - b. Submittals Schedule.
  - c. Contractor's Construction Schedule.
2. Submit the Schedule of Values to Architect at earliest possible date but no later than seven days before the date scheduled for submittal of initial Applications for Payment.

Format and Content: Use the Project Manual table of contents as a guide to establish line items for the Schedule of Values. Provide at least one line item for each Specification Section.

1. Identification: Include the following Project identification on the Schedule of Values:
  - a. Project name and location.
  - b. Name of Architect.
  - c. Architect's project number.
  - d. Contractor's name and address.
  - e. Date of submittal.
2. Submit draft of ABC Form C-11.
3. Arrange the Schedule of Values in tabular form with separate columns to indicate the following for each item listed:
  - a. Related Specification Section or Division.
  - b. Description of the Work.
  - c. Name of subcontractor.
  - d. Name of manufacturer or fabricator.
  - e. Name of supplier.
  - f. Change Orders (numbers) that affect value.
  - g. Dollar value.
    - 1) Percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.
4. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with the Project Manual table of contents. Provide several line items for principal subcontract amounts, where appropriate.
5. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
6. Provide a separate listing on Application and Certificate for Payment (Standard ABC Form C-10ST, July 2004) for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
  - a. Differentiate between items stored on-site and items stored off-site. Include evidence of insurance or evidence of bonded warehousing.
7. Provide separate line items in the Schedule of Values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
8. Unit Costs: Provide a separate line item in the Schedule of Values for each unit cost. Line-item to show value of unit-cost allowances, as a product of the unit cost, multiplied by measured quantity. Use information indicated in the Contract Documents to determine quantities.

9. Each item in the Schedule of Values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.
  - a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the Schedule of Values or distributed as general overhead expense, at Contractor's option.
10. Schedule Updating: Update and resubmit the Schedule of Values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

### APPLICATIONS FOR PAYMENT

Each Application for Payment shall be consistent with previous applications and payments as certified by Architect and paid for by Owner.

1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.

Payment Application Times: Progress payments shall be submitted to Architect by the 25th of the month. The period covered by each Application for Payment is one month, ending on the 23rd of the month.

Payment Application Forms: Use Application and Certificate for Payment (Standard ABC Form C-10ST, July 2004) as form for Applications for Payment.

Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Architect will return incomplete applications without action.

1. Entries shall match data on the Schedule of Values and Contractor's Construction Schedule. Use updated schedules if revisions were made.
2. Include amounts of Change Orders issued before last day of construction period covered by application only after all agency approvals.

Transmittal: Submit 6 signed and notarized original copies of each Application for Payment to Architect by a method ensuring receipt within 24 hours. One copy shall include waivers of lien and similar attachments if required.

1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.

Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's liens from subcontractors, sub-subcontractors, and suppliers for construction period covered by the previous application.

1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
2. When an application shows completion of an item, submit final or full waivers.
3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
4. Submit final Application for Payment with or preceded by final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.
5. Waiver Forms: Submit waivers of lien on forms, executed in a manner acceptable to Owner.

Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:

1. List of subcontractors.
2. Schedule of Values.
3. Contractor's Construction Schedule (preliminary if not final).
4. Products list.
5. Schedule of unit prices.
6. Submittals Schedule (preliminary if not final).
7. List of Contractor's staff assignments.
8. List of Contractor's principal consultants.
9. Copies of building permits.
10. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
11. Initial progress report.
12. Report of preconstruction conference.

Application for Payment at Substantial Completion: After issuing the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.

1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
2. This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.

Final Payment Application: Submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:

1. Evidence of completion of Project closeout requirements.
2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
3. Updated final statement, accounting for final changes to the Contract Sum.
4. Certificate of Substantial Completion (Standard ABC Form C-13, August 2001)
5. Form of Advertisement for Completion (Standard ABC Form C-14, August 2001)
6. Evidence that claims have been settled.
7. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.
8. Final, liquidated damages settlement statement.

END OF SECTION 01290



## SECTION 01320 - CONSTRUCTION PROGRESS DOCUMENTATION

### PART 1 – GENERAL

#### RELATED DOCUMENTS

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

#### SUMMARY

This Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:

1. Contractor's Construction Schedule.
2. Submittals Schedule.
3. Daily construction reports.
4. Material location reports.
5. Field condition reports.
6. Special reports.

Related Sections include the following:

1. Division 1 Section 01290 "Payment Procedures" for submitting the Schedule of Values.
2. Division 1 Section 01310 "Project Management and Coordination" for submitting and distributing meeting and conference minutes.
3. Division 1 Section 01330 "Submittal Procedures" for submitting schedules and reports.
4. Division 1 Section 01322 "Photographic Documentation" for submitting construction photographs.
5. Division 1 Section 01400 "Quality Requirements" for submitting a schedule of tests and inspections.

#### SUBMITTALS

Submittals Schedule: Submit three copies of schedule. Arrange the following information in a tabular format:

1. Scheduled date for first submittal.
2. Specification Section number and title.
3. Submittal category (action or informational).
4. Name of subcontractor.

5. Description of the Work covered.
6. Scheduled date for Architect's final release or approval.

Contractor's Construction Schedule: Submit two opaque copies of initial schedule, large enough to show entire schedule for entire construction period.

Daily Construction Reports: Submit two copies at weekly intervals.

Material Location Reports: Submit two copies at monthly intervals.

Field Condition Reports: Submit two copies at time of discovery of differing conditions.

Special Reports: Submit two copies at time of unusual event.

Pre-scheduling Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination." Review methods and procedures related to the Preliminary Construction Schedule and Contractor's Construction Schedule, including, but not limited to, the following:

1. Verify availability of qualified personnel needed to develop and update schedule.
2. Discuss any constraints.
3. Review time required for review of submittals and re-submittals.
4. Review requirements for tests and inspections by independent testing and inspecting agencies.
5. Review time required for completion and startup procedures.
6. Review and finalize list of construction activities to be included in schedule.
7. Review submittal requirements and procedures.
8. Review procedures for updating schedule.

## COORDINATION

Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate contractors.

Coordinate Contractor's Construction Schedule with the Schedule of Values, list of subcontracts, Submittals Schedule, progress reports, payment requests, and other required schedules and reports.

1. Secure time commitments for performing critical elements of the Work from parties involved.

2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

## PART 2 – PRODUCTS

### SUBMITTALS SCHEDULE

Preparation: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, re-submittal, ordering, manufacturing, fabrication, and delivery when establishing dates.

1. Coordinate Submittals Schedule with list of subcontracts, the Schedule of Values, and Contractor's Construction Schedule.
2. Initial Submittal: Include submittals required during the first 60 days of construction. List those required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
3. Final Submittal: Submit concurrently with the first complete submittal of Contractor's Construction Schedule.

### CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

Procedures: Comply with procedures contained in AGC's "Construction Planning & Scheduling."

Time Frame: Extend schedule from date established for the Notice to Proceed to date of Substantial Completion.

1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.

Activities: Treat each story or separate area as a separate numbered activity for each principal element of the Work. Comply with the following:

1. Activity Duration: Define activities so no activity is longer than 30 days, unless specifically allowed by Architect.
2. Procurement Activities: Include procurement process activities for the following long lead items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.

3. Submittal Review Time: Include review and re-submittal times indicated in Division 1 Section 01330 "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's Construction Schedule with Submittals Schedule.
4. Startup and Testing Time: Include not less than 14 days for startup and testing.
5. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Architect's administrative procedures necessary for certification of Substantial Completion.

Constraints: Include constraints and work restrictions, if any, and show how the sequence of the Work is affected.

Cost Correlation: At the head of schedule, provide a cost correlation line, indicating planned and actual costs. On the line, show dollar volume of the Work performed as of dates used for preparation of payment requests.

1. Refer to Division 1 Section 01290 "Payment Procedures" for cost reporting and payment procedures.
2. Contractor shall assign cost to construction activities on the CPM schedule. Costs shall not be assigned to submittal activities unless specified otherwise but may, with Architect's approval, be assigned to fabrication and delivery activities. Costs shall be broken down within principal contracts in amounts typically not greater than \$30,000, but in no case greater than 5 percent of the Contract Sum.
3. Each activity cost shall reflect an accurate value subject to approval by Architect.
4. Total cost assigned to activities shall equal the total Contract Sum.

Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis to demonstrate the time effect, if any, of the proposed change on the overall project schedule.

#### CONTRACTOR'S CONSTRUCTION SCHEDULE (CPM SCHEDULE)

General: Prepare network diagrams using AON (activity-on-node) format.

Preliminary Network Diagram: Submit diagram within 14 days of date established for the Notice to Proceed. Outline significant construction activities for the first 60 days of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.

CPM Schedule: Prepare Contractor's Construction Schedule using a computerized, cost-and resource-loaded, time-scaled CPM network analysis diagram for the Work.

1. Develop network diagram in sufficient time to submit CPM schedule so it can be accepted for use no later than 30 days after date established for the Notice to Proceed.
  - a. Failure to include any work item required for performance of this Contract shall not excuse Contractor from completing all work within applicable completion dates, regardless of Architect's approval of the schedule.
2. Conduct educational workshops to train and inform key Project personnel, including subcontractors' personnel, in proper methods of providing data and using CPM schedule information.
3. Establish procedures for monitoring and updating CPM schedule and for reporting progress. Coordinate procedures with progress meeting and payment request dates.
4. Use "one workday" as the unit of time. Include list of nonworking days and holidays incorporated into the schedule.

CPM Schedule Preparation: Prepare a list of all activities required to complete the Work. Using the preliminary network diagram, prepare a skeleton network to identify probable critical paths.

1. Activities: Indicate the estimated time duration, sequence requirements, and relationship of each activity in relation to other activities. Include estimated time frames for the following activities:
  - a. Preparation and processing of submittals.
  - b. Mobilization and demobilization.
  - c. Purchase of materials.
  - d. Delivery.
  - e. Fabrication.
  - f. Utility interruptions.
  - g. Installation.
  - h. Work by Owner that may affect or be affected by Contractor's activities.
  - i. Testing and commissioning.
2. Critical Path Activities: Identify critical path activities, including those for interim completion dates. Scheduled start and completion dates shall be consistent with Contract milestone dates.
3. Processing: Process data to produce output data on a computer-drawn, timescaled network. Revise data, reorganize activity sequences, and reproduce as often as necessary to produce the CPM schedule within the limitations of the Contract Time.
4. Format: Mark the critical path. Locate the critical path near center of network; locate paths with most float near the edges.
  - a. Sub-networks on separate sheets are permissible for activities clearly off the critical path.

Initial Issue of Schedule: Prepare initial network diagram from a list of straight "early start-total float" sort. Identify critical activities. Prepare tabulated reports showing the following:

1. Contractor or subcontractor and the Work or activity.
2. Description of activity.
3. Principal events of activity.
4. Immediate preceding and succeeding activities.
5. Early and late start dates.
6. Early and late finish dates.
7. Activity duration in workdays.
8. Total float or slack time.
9. Average size of workforce.
10. Dollar value of activity (coordinated with the Schedule of Values).

Schedule Updating: Concurrent with making revisions to schedule, prepare tabulated reports showing the following:

1. Identification of activities that have changed.
2. Changes in early and late start dates.
3. Changes in early and late finish dates.
4. Changes in activity durations in workdays.
5. Changes in the critical path.
6. Changes in total float or slack time.
7. Changes in the Contract Time.

Value Summaries: Prepare two cumulative value lists, sorted by finish dates.

1. In first list, tabulate activity number, early finish date, dollar value, and cumulative dollar value.
2. In second list, tabulate activity number, late finish date, dollar value, and cumulative dollar value.
3. In subsequent issues of both lists, substitute actual finish dates for activities completed as of list date.
4. Prepare list for ease of comparison with payment requests; coordinate timing with progress meetings.
  - a. In both value summary lists, tabulate "actual percent complete" and "cumulative value completed" with total at bottom.
  - b. Submit value summary printouts one week before each regularly scheduled progress meeting.

## REPORTS

Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:

1. List of subcontractors at Project site.
2. Approximate count of personnel at Project site by trade.
3. Equipment at Project site.
4. Material deliveries.
5. High and low temperatures and general weather conditions.
6. Accidents.
7. Meetings and significant decisions.
8. Unusual events (refer to special reports).
9. Stoppages, delays, shortages, and losses.
10. Meter readings and similar recordings.
11. Emergency procedures.
12. Orders and requests of authorities having jurisdiction.
13. Change Orders received and implemented.
14. Construction Change Directives and Architect Supplemental Interpretations (Instructions) received and implemented.
15. Services connected and disconnected.
16. Equipment or system tests and startups.

Material Location Reports: At monthly intervals, prepare and submit a comprehensive list of materials delivered to and stored at Project site. List shall be cumulative, showing materials previously reported plus items recently delivered. Include with list a statement of progress on and delivery dates for materials or items of equipment fabricated or stored away from Project site.

Field Condition Reports: Immediately on discovery of a difference between field conditions and the Contract Documents, prepare and submit a detailed report. Submit with a Request For Interpretation (RFI). Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

## SPECIAL REPORTS

General: Submit special reports directly to Owner within one day of an occurrence. Distribute copies of report to parties affected by the occurrence.

Reporting Unusual Events: When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons participating, response by Contractor's personnel, evaluation of results or effects, and similar pertinent information. Advise Owner in advance when these events are known or predictable.

## PART 3 – EXECUTION

### CONTRACTOR'S CONSTRUCTION SCHEDULE

Contractor must employ skilled personnel with experience in scheduling and reporting techniques or must employ a scheduling consultant. Submit qualifications and examples of previous scheduling for evaluation (and approval) by the Architect.

Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule three (3) work days before each regularly scheduled progress meeting or Contractor may update schedule at the monthly progress meeting.

1. The revised schedule should be updated immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting, no later than three days after the progress meeting.
2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
3. As the Work progresses, indicate Actual Completion percentage for each activity.

Distribution: Distribute copies of approved schedule to Architect, Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.

1. Post copies in Project meeting rooms and temporary field offices.
2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

END OF SECTION 01320



## SECTION 01322 - PHOTOGRAPHIC DOCUMENTATION

### PART 1 – GENERAL

#### RELATED DOCUMENTS

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

#### SUMMARY

This Section includes administrative and procedural requirements for the following:

1. Preconstruction digital video.
2. Periodic construction photographs.

Related Sections include the following:

1. Division 1 Section 01330 "Submittal Procedures" for submitting photographic documentation.

#### SUBMITTALS

Key Plan: Submit key plan of Project site and building with notation of vantage points marked for location and direction of each digital photograph. Indicate elevation or story of construction. Include same label information as corresponding set of photographs.

Digital Construction Photographs: Submit one print of each digital photographic view within seven days of taking photographs.

1. Format: Digital.
2. Identification: The following information is required on each CD submitted:
  - a. Name of Project.
  - b. Name of Architect.
  - c. Name of Contractor.
  - d. Date photograph was taken if not date stamped by camera.
  - e. Description of vantage point, indicating location, direction (by compass point), and elevation or story of construction.
  - f. Unique sequential identifier.

3. Digital Images: Submit a complete set of digital image electronic files as a Project Record Document on CD-ROM. Identify electronic media with date photographs were taken. Submit images that have same aspect ratio as the sensor, uncropped.

Digital Video: Submit one copy of each digital video with protective sleeve or case within seven days of recording.

1. Identification: On each copy, provide an applied label with the following information:
  - a. Name of Project.
  - b. Name of Architect.
  - c. Name of Contractor.
  - d. Description of vantage point, indicating location, direction (by compass point), and elevation or story of construction.
  - e. Date digital video was recorded.
  - f. Weather conditions at time of recording.
2. Transcript: To include an audio narrative with the following information as a minimum.
  - a. Name of Project.
  - b. Date digital video was recorded.
  - c. Weather conditions at time of recording.
  - d. Description of vantage point, indicating location, direction (by compass point), and elevation or story of construction.

## PART 2 – EXECUTION

### CONSTRUCTION PHOTOGRAPHS

#### Film Images:

1. Date Stamp: Unless otherwise indicated, date and time stamp each photograph as it is being taken so stamp is integral to photograph.
2. Field Office Prints: Retain one set of prints of progress photographs in the field office at Project site, available at all times for reference. Identify photographs same as for those submitted to Architect.

Digital Images: Submit digital images exactly as originally recorded in the digital camera, without alteration, manipulation, editing, or modifications using image-editing software.

1. Date and Time: Include date and time in filename for each image.
2. Field Office Images: Maintain one set of images on CD-ROM in the field office at Project site, available at all times for reference. Identify images same as for those submitted to Architect.

Preconstruction Photographs: Before starting construction, take color, digital photographs of Project site and surrounding properties, including existing items to remain during construction, from different vantage points, as directed by Architect.

1. Flag construction limits before taking construction photographs.
2. Take eight photographs to show existing conditions adjacent to property before starting the Work.
3. Take eight photographs of existing buildings either on or adjoining property in order to accurately record physical conditions at start of construction.
4. Take additional photographs as required to record settlement or cracking of adjacent structures, pavements, and improvements.

Periodic Construction Photographs: Take 12 color, digital photographs monthly, coinciding with the cutoff date associated with each Application for Payment. Select vantage points to show status of construction and progress since last photographs were taken.

#### CONSTRUCTION DIGITAL VIDEO

Narration: Describe scenes on digital video by audio narration by microphone while video is recorded. Include description of items being viewed, recent events, and planned activities. At each change in location, describe vantage point, location, direction (by compass point), and elevation or story of construction.

1. Confirm date and time at beginning and end of recording.
2. Begin each digital video with name of Project, Contractor's name, and Project location.

Preconstruction Digital Video: Before starting construction, provide digital video of the Project site and surrounding properties from different vantage points, as needed to properly record all preexisting site conditions and adjacent conditions of all roadways, drives, structures that will incur construction traffic.

1. Flag construction limits before recording construction video.
2. Show existing conditions adjacent to Project site before starting the Work.
3. Show existing buildings either on or adjoining Project site to accurately record physical conditions at the start of construction.
4. Show protection efforts by Contractor.

END OF SECTION 01322

## SECTION 01330 - SUBMITTAL PROCEDURES

### PART 1 – GENERAL

#### RELATED DOCUMENTS

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

#### SUMMARY

The General Contractor shall use website software “Submittal Exchange” to conduct all submittal reviews in electronic format. Paper format submittals will not be accepted. All recordkeeping, date stamping, access controls, shall be paid for by the contractor with access given to the entire Project Team. The software shall be capable of the following:

##### Costs:

1. The General Contractor shall include the full cost of Submittal Exchange project subscription in their proposal. This cost is included in the Contract Amount. Contact Submittal Exchange at 1-800-714-0024 to verify cost prior to bid.
2. At the Contractor’s option, training is available from Submittal Exchange regarding use of website and PDF submittals. Contact Submittal Exchange at 1-800-714-0024.
3. Internet Service and Equipment Requirements:
  - a. Email address and Internet access at the Contractor’s main office.
  - b. Adobe Acrobat ([www.adobe.com](http://www.adobe.com)), Bluebeam PDF Revu ([www.bluebeam.com](http://www.bluebeam.com)), or other similar PDF review software for applying electronic stamps and comments.

##### Procedures:

1. Shop drawing and product data submittals shall be transmitted to Architect in electronic (PDF) format using Submittal Exchange, a website service designed specifically for transmitting submittals between construction team members.
2. The intent of electronic submittals is to expedite the construction process by reducing paperwork, improving information flow, and decreasing turnaround time.

3. The electronic submittal process is not intended for color samples, color charts, or physical material samples.
4. Submittal Preparation – the Contractor may use any or all of the following options:
  - a. Subcontractors and Suppliers provide electronic (PDF) submittals to the Contractor via the Submittal Exchange website.
  - b. Subcontractors and Suppliers provide paper submittals to the General Contractor who electronically scans and converts to PDF format.
  - c. Subcontractors and Suppliers provide paper submittals to Scanning Service which electronically scans and converts to PDF format.
5. The Contractor shall review and apply electronic stamp certifying that the submittal complies with the requirements of the Contract Documents including verification of manufacturer / product, dimensions and coordination of information with other parts of the work.
6. The Contractor shall transmit each submittal to Architect using the Submittal Exchange website, [www.submittalexchange.com](http://www.submittalexchange.com).
7. The Architect / Engineer review comments will be made available on the Submittal Exchange website for downloading. Contractor will receive email notice of completed review.
8. Distribution of reviewed submittals to subcontractors and suppliers is the responsibility of the Contractor.
9. Submit paper copies of reviewed submittals at project closeout for record purposes in accordance with Section 01770 – Closeout Procedures.

Related Sections include the following:

1. Division 1 Section 01290 "Payment Procedures" for submitting Applications for Payment and the Schedule of Values.
2. Division 1 Section 01310 "Project Management and Coordination" for submitting and distributing meeting and conference minutes and for submitting Coordination Drawings.
3. Division 1 Section 01320 "Construction Progress Documentation" for submitting schedules and reports, including Contractor's Construction Schedule and the Submittals Schedule.
4. Division 1 Section 01322 "Photographic Documentation" for submitting construction photographs and construction videotapes.
5. Division 1 Section 01400 "Quality Requirements" for submitting test and inspection reports and for mockup requirements.
6. Division 1 Section 01770 "Closeout Procedures" for submitting warranties.

7. Division 1 Section 01781 "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.
8. Division 1 Section 01782 "Operation and Maintenance Data" for submitting operation and maintenance manuals.
9. Division 1 Section 01820 "Demonstration and Training" for submitting videotapes of demonstration of equipment and training of Owner's personnel.
10. Divisions 2 through 16 Sections for specific requirements for submittals in those Sections.

## DEFINITIONS

Action Submittals: Written and graphic information that requires Architect's responsive action.

Informational Submittals: Written information that does not require Architect's responsive action. Submittals may be rejected for not complying with requirements.

## SUBMITTAL PROCEDURES

General: Electronic copies of CAD Drawings of the Contract Drawings will, under certain circumstances described hereinafter, be provided by Architect for Contractor's use in preparing submittals.

Coordination: Coordinate preparation and processing of submittals with performance of construction activities.

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
  - a. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

Submittals Schedule: Comply with requirements in Division 1 Section 01320 "Construction Progress Documentation" for list of submittals and time requirements for scheduled performance of related construction activities.

Processing Time: Allow enough time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals

1. Initial Review: Allow **14** business days for initial review of each digital submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
3. Re-submittal Review: Allow **10** business days for review of each re-submittal.
4. Sequential Review: Where sequential review of submittals by Architect's consultants, Owner, or other parties is indicated, allow **10** business days for initial review of each submittal.
  - a. Structural, mechanical, plumbing, electrical, civil, audio/visual, sound system, and kitchen equipment components are examples of the Work that require sequential review. Architect will advise if there are others.

Identification: Place a permanent label or title block on each submittal for identification.

1. Indicate name of firm or entity that prepared each submittal on label or title block.
2. Provide a space approximately 6 by 8 inches on label or beside title block to record Contractor's review and approval markings. Provide another area of this same size for the Architect to affix his stamp. Stamp includes the following four categories: Reviewed, Furnish as Noted, Rejected, Revise and Resubmit; the Architect will mark one or more of these categories and return submittal to Contractor.
3. Include the following information on label for processing and recording action taken:
  - a. Project name.
  - b. Date.
  - c. Name and address of Architect.
  - d. Name and address of Contractor.
  - e. Name and address of subcontractor.
  - f. Name and address of supplier.
  - g. Name of manufacturer.
  - h. Submittal number or other unique identifier, including revision identifier.

1. Submittal number shall use Specification Section number followed by a decimal point and then a sequential number (e.g., 06100.D.2.01). Re-submittals shall include an alphabetic suffix after another decimal point (e.g., 06100.D.2.R1 (R2, R3 etc. if necessary).
  - i. Number and title of appropriate Specification Section.
  - j. Drawing number and detail references, as appropriate.
  - k. Location(s) where product is to be installed, as appropriate.
  - l. Other necessary identification.

Deviations: Encircle or otherwise specifically identify deviations and list the deviations from the Contract Documents on submittals and list the deviations on the transmittal form accompanying submittal.

Transmittal: Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Architect will return submittals, without review, received from sources other than Contractor.

1. Transmittal Form: Use AIA Document G810 or equivalent with at least the following information.
  - a. Project name.
  - b. Date.
  - c. Destination (To:).
  - d. Source (From:).
  - e. Names of subcontractor, manufacturer, and supplier.
  - f. Category and type of submittal.
  - g. Submittal purpose and description.
  - h. Specification Section number and title.
  - i. Drawing number and detail references, as appropriate.
  - j. Transmittal number, numbered consecutively.
  - k. Submittal and transmittal distribution record.
  - l. Remarks.
  - m. Signature of transmitter.
2. On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Architect on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same label information as related submittal.



Re-submittals: Make re-submittals in same form and number of copies as initial submittal.

1. Note date and content of previous submittal.
2. Note date and content of revision in label or title block and clearly indicate extent of revision.
3. Resubmit submittals until they are marked "Reviewed" or "Furnished as Noted".

Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.

Use for Construction: Use only final submittals with mark indicating "Reviewed" or "Furnished as Noted".

### CONTRACTOR'S USE OF ARCHITECT'S CAD FILES

General: At Contractor's written request, copies of Architect's CAD files will be provided to Contractor for Contractor's use in connection with Project, subject to the following conditions:

1. Contractor must sign a detailed agreement with the Architect that outlines responsibilities, liabilities, etc. of each party and must pay to the Architect a fee of \$75.00 for each sheet of drawings that are put on a disk for the Contractor's use.

## PART 2 – PRODUCTS

### DIGITAL ACTION SUBMITTALS

General: Prepare and submit Digital Action Submittals required by individual Specification Sections.

All digital submittals and Shop Drawings shall be sent to the email address as referenced in the "Advertisement For Bids".

Product Data: Collect information into a single digital submittal for each element of construction and type of product or equipment.

1. If information must be specially prepared for submittal because standard printed data are not suitable for use, submit as Shop Drawings, not as Product Data.

2. Mark each copy of each the digital submittal to show which products and options are applicable.
3. Include the following information, as applicable:
  - a. Manufacturer's written recommendations.
  - b. Manufacturer's product specifications.
  - c. Manufacturer's installation instructions.
  - d. Standard color charts.
  - e. Manufacturer's catalog cuts.
  - f. Wiring diagrams showing factory-installed wiring.
  - g. Printed performance curves.
  - h. Operational range diagrams.
  - i. Mill reports.
  - j. Standard product operation and maintenance manuals.
  - k. Compliance with specified referenced standards.
  - l. Testing by recognized testing agency.
  - m. Application of testing agency labels and seals.
  - n. Notation of coordination requirements.
4. Submit Product Data before or concurrent with Samples.
5. Number of Copies: Submit digital copy of the Product Data, unless otherwise indicated. Mark up and retain returned digital copy as a Project Record Document.

Digital Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data, unless submittal of Architect's CAD Drawings are otherwise permitted.

1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
  - a. Dimensions.
  - b. Identification of products.
  - c. Fabrication and installation drawings.
  - d. Roughing-in and setting diagrams.
  - e. Wiring diagrams showing field-installed wiring, including power, signal, and control wiring.
  - f. Shopwork manufacturing instructions.
  - g. Templates and patterns.
  - h. Schedules.
  - i. Design calculations.
  - j. Compliance with specified standards.
  - k. Notation of coordination requirements.
  - l. Notation of dimensions established by field measurement.
  - m. Relationship to adjoining construction clearly indicated.
  - n. Seal and signature of professional engineer if specified.
  - o. Wiring Diagrams: Differentiate between manufacturer-installed and field installed wiring.

2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Digital Shop Drawings on sheets at least 8-1/2 by 11 inches but no larger than 30 by 42 inches.
3. Number of Copies:
  - a. Submit each original digital drawing submittal (specifically prepared for the project). Do not include MSDS documentation in any submittal. Architect will retain marked-up copy for his records and will return 1 (one) digital marked-up copy to the Contractor.
  - b. Submit digital copy (bound in sets) of hardware submittals, fixture schedules, manufacturers' data and all other submittals that have been prepared in an 11 inch by 17 inch or smaller format. The Architect will return 1 (one) digital copy set to the Contractor.
    1. Upon receipt of his digital marked up shop drawings/submittals, the Contractor shall make as many copies for distribution as he deems necessary, however he shall retain one copy to mark-up further to show any and all construction changes that modify the submittal in any form. This document(s) shall be turned over to the Owner at the end of the Project along with the Record Documents.

Color code: On all digital shop drawings submittals, schedules, etc., the Contractor's marks shall be in red, the Architect's in green and the Engineer's (if any involved) in blue. All comments shall be initialed by a responsible party within each organization.

Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.

1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
2. Identification: Attach label on unexposed side of Samples that includes the following:
  - a. Generic description of Sample.
  - b. Product name and name of manufacturer.
  - c. Sample source.
  - d. Number and title of appropriate Specification Section.
3. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.

- a. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.
- 4. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available. **Colors will not be approved until all color submittals are received by the architect.**
  - a. Number of Samples: Submit two full sets of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return one submittal with options selected.
  - b. All color submittals are due within 45 days of the Notice to Proceed.
  - c. The architect will be allowed 15 days from the date of the receipt of the last color submittal to approve colors.
- 5. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
  - a. Number of Samples: Submit two sets of Samples. Architect will retain one Sample set and one will be returned. Mark up returned Sample set as a Project Record Sample.
    - 1. Construct a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
    - 2. If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of paired units that show approximate limits of variations.

Interior Color Selections: Any submittals that are associated with the aesthetics of the interior design shall not be approved until all submittals associated with the interior design are in the Architect's possession.

Submittals Schedule: Comply with requirements specified in Division 1 Section 01320 "Construction Progress Documentation."

Application for Payment: Comply with requirements specified in Division 1 Section 01290 "Payment Procedures."

Schedule of Values: Comply with requirements specified in Division 1 Section 01290 "Payment Procedures."

### INFORMATIONAL SUBMITTALS

General: Prepare and submit Informational Submittals required by other Specification Sections.

1. Number of Copies: Submit digital copy of each submittal, unless otherwise indicated.
2. Certificates and Certifications: Provide a notarized statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
3. Test and Inspection Reports: Comply with requirements specified in Division 1 Section 01400 "Quality Requirements."

Coordination Drawings: Comply with requirements specified in Division 1 Section, 01310 "Project Management and Coordination."

Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification (WPS) and Procedure Qualification Record (PQR) on AWS forms. Include names of firms and personnel certified.

Installer Certificates: Prepare written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.

Manufacturer Certificates: Prepare written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.

Product Certificates: Prepare written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.

Material Certificates: Prepare written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.

Material Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.

Product Test Reports: Prepare written reports indicating current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.

Research/Evaluation Reports: Prepare written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:

1. Name of evaluation organization.
2. Date of evaluation.
3. Time period when report is in effect.
4. Product and manufacturers' names.
5. Description of product.
6. Test procedures and results.
7. Limitations of use.

Schedule of Tests and Inspections: Comply with requirements specified in Division 1 Section 01400 "Quality Requirements."

Preconstruction Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.

Compatibility Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.

Field Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.

Maintenance Data: Prepare written and graphic instructions and procedures for operation and normal maintenance of products and equipment. Comply with requirements specified in Division 1 Section 01782 "Operation and Maintenance Data."

Design Data: Prepare written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

Manufacturer's Instructions: Prepare written or published information that documents manufacturer's recommendations, guidelines, and procedures for installing or operating a product or equipment. Include name of product and name, address, and telephone number of manufacturer. Include the following, as applicable:

1. Preparation of substrates.
2. Required substrate tolerances.
3. Sequence of installation or erection.
4. Required installation tolerances.
5. Required adjustments.
6. Recommendations for cleaning and protection.

Manufacturer's Field Reports: Prepare written information documenting factory authorized service representative's tests and inspections. Include the following, as applicable:

1. Name, address, and telephone number of factory-authorized service representative making report.
2. Statement on condition of substrates and their acceptability for installation of product.
3. Statement that products at Project site comply with requirements.
4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
6. Statement whether conditions, products, and installation will affect warranty.
7. Other required items indicated in individual Specification Sections.

Insurance Certificates and Bonds: Prepare written information indicating current status of insurance or bonding coverage. Include name of entity covered by insurance or bond, limits of coverage, amounts of deductibles, if any, and term of the coverage.

Construction Photographs and Videotapes: Comply with requirements specified in Division 1 Section 01322 "Photographic Documentation."

Material Safety Data Sheets (MSDSs): Submit information directly to Owner; do not submit to Architect.

1. Architect will not review submittals that include MSDSs and will return the entire submittal for re-submittal.

### DELEGATED DESIGN

Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.

1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.

Delegated-Design Submittal: In addition to Shop Drawings, Product Data, and other required submittals, submit one copy of a statement, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.

1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

## PART 3 – EXECUTION

### CONTRACTOR'S REVIEW

Review each digital submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.

Approval Stamp: Stamp each digital submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement



certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

### ARCHITECT'S ACTION

General: Architect will not review digital submittals that do not bear Contractor's approval stamp and will return them without action.

Action Submittals: Architect will review each digital submittal, make marks to indicate corrections or modifications required, and return it. Architect will stamp each digital submittal with an action stamp and will mark stamp appropriately to indicate action taken, as follows:

1. REVIEWED—Indicates that reviewed submittal is satisfactory.
2. REJECTED—Indicates submittal is not satisfactory and another properly prepared submittal of same or another product must be prepared and resubmitted.
3. FURNISH AS NOTED—Indicates submittal is satisfactory if the changes, modifications, notes, etc. marked by the Architect are made a part of the submittal.
4. REVISE AND RESUBMIT—Indicates although parts of the submittal are satisfactory, there are enough significant modifications that must be made to require the Contractor, subcontractor, supplier, and/or manufacturer to provide additional essential information to his submittal and then resubmit it to the Architect.

Informational Submittals: Architect will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.

Partial submittals are not acceptable, will be considered nonresponsive, and will be returned without review.

Submittals not required by the Contract Documents may not be reviewed and may be discarded.

END OF SECTION 01330

## SECTION 01400 - QUALITY REQUIREMENTS

### PART 1 – GENERAL

#### RELATED DOCUMENTS

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

#### SUMMARY

This Section includes administrative and procedural requirements for quality assurance and quality control.

Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.

1. Specific quality-assurance and control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and control procedures that facilitate compliance with the Contract Document requirements.
3. Requirements for Contractor to provide quality-assurance and -control services required by Architect, Owner, or authorities having jurisdiction are not limited by provisions of this Section.

Related Sections include the following:

1. Divisions 2 through 16 Sections for specific test and inspection requirements.

#### DEFINITIONS

Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.

Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Architect.

Mockups: Full-size, physical assemblies that are constructed on-site. Mockups are used to verify selections made under sample submittals, to demonstrate aesthetic effects and, where indicated, qualities of materials and execution, and to review construction, coordination, testing, or operation; they are not Samples. Approved mockups establish the standard by which the Work will be judged.

Laboratory Mockups: Full-size, physical assemblies that are constructed at testing facility to verify performance characteristics.

Preconstruction Testing: Tests and inspections that are performed specifically for the Project before products and materials are incorporated into the Work to verify performance or compliance with specified criteria.

Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with industry standards.

Source Quality-Control Testing: Tests and inspections that are performed at the source, i.e., plant, mill, factory, or shop.

Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.

Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.

Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.

1. Using a term such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to tradespeople of the corresponding generic name.

Experienced: When used with an entity, "experienced" means having successfully completed a minimum of five previous projects similar in size and scope to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

## CONFLICTING REQUIREMENTS

General: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to Architect for a decision before proceeding.

Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

## SUBMITTALS

Qualification Data: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.

Schedule of Tests and Inspections: Prepare in tabular form and include the following:

1. Specification Section number and title.
2. Description of test and inspection.

Reports: Prepare and submit certified written reports that include the following:

1. Date of issue.
2. Project title and number.
3. Name, address, and telephone number of testing agency.
4. Dates and locations of samples and tests or inspections.
5. Names of individuals making tests and inspections.
6. Description of the Work and test and inspection method.
7. Identification of product and Specification Section.
8. Complete test or inspection data.
9. Test and inspection results and an interpretation of test results.

10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
12. Name and signature of laboratory inspector.
13. Recommendations on retesting and reinspecting.

Licenses, and Certificates: For Owner's records, submit copy of licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

## QUALITY ASSURANCE

General: Qualifications paragraphs in this Article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.

Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar to those indicated for this Project in material, design, and extent.

Specialists: Certain sections of the Specifications require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.

1. Requirement for specialists shall not supersede building codes and regulations governing the Work.

Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 548; and with additional qualifications specified in individual Sections; and where required by authorities having jurisdiction, that is acceptable to authorities.

1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.

Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:

1. Contractor responsibilities include the following:
  - a. Provide test specimens representative of proposed products and construction.
  - b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
  - c. Provide sizes and configurations of test assemblies, mockups, and laboratory mockups to adequately demonstrate capability of products to comply with performance requirements.
  - d. Build site-assembled test assemblies and mockups using installers who will perform same tasks for Project.
  - e. When testing is complete, remove test specimens, assemblies, mockups, and laboratory mockups; do not reuse products on Project.
2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Architect, with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.

Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:

1. Build mockups in location and of size indicated or, if not indicated, as directed by Architect.
2. Notify Architect seven days in advance of dates and times when mockups will be constructed.
3. Demonstrate the proposed range of aesthetic effects and workmanship.
4. Obtain Architect's approval of mockups before starting work, fabrication, or construction.
  - a. Allow seven days for initial review and each re-review of each mockup.
5. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
6. Demolish and remove mockups when directed, unless otherwise indicated.

#### QUALITY CONTROL

Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.

1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.
2. Payment for these services will be made by the Owner directly to the Testing Agency.
3. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.

Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.

1. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.
2. Notify testing agencies whether employed by the Owner or the Contractor, at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.

3. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
4. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Division 1 Section "Submittal Procedures."

Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.

Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:

1. Access to the Work.
2. Incidental labor and facilities necessary to facilitate tests and inspections.
3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
4. Facilities for storage and field curing of test samples.
5. Preliminary design mix proposed for use for material mixes that require control by testing agency.
6. Security and protection for samples and for testing and inspecting equipment at Project site.

Coordination: Coordinate sequence of activities to accommodate required quality assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.

1. Schedule times for tests, inspections, obtaining samples, and similar activities.

Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents. Submit schedule within 30 days of date established for the Notice to Proceed.



1. Distribution: Distribute schedule to Owner, Architect, testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.

## SPECIAL TESTS AND INSPECTIONS

Special Tests and Inspections: Owner will engage a qualified special inspector to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner, and as follows:

Special Tests and Inspections: Conducted by a qualified special inspector as required by authorities having jurisdiction, as indicated in individual Specification Sections, and as follows:

1. Verifying that manufacturer maintains detailed fabrication and quality control procedures and reviewing the completeness and adequacy of those procedures to perform the Work.
2. Notifying Architect and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
3. Submitting a certified written report of each test, inspection, and similar quality control service to Architect with copy to Contractor and to authorities having jurisdiction.
4. Submitting a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
5. Interpreting tests and inspections and stating in each report whether tested and inspected work complies with or deviates from the Contract Documents.
6. Retesting and reinspecting corrected work.

## PART 2 – EXECUTION

### TEST AND INSPECTION LOG

Those conducting tests whether in the employ of the Owner or the Contractor must prepare a record of tests and inspections that include the following:

1. Date test or inspection was conducted.
2. Description of the Work tested or inspected.
3. Date test or inspection results were transmitted to Architect.
4. Identification of testing agency or special inspector conducting test or inspection.

Maintain log at Project site. Post changes and modifications as they occur. Provide access to test and inspection log for Architect's reference during normal working hours.

#### REPAIR AND PROTECTION

General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.

Protect construction exposed by or for quality-control service activities.

Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 01400

## SECTION 01420 – REFERENCES

### PART 1 – GENERAL

#### RELATED DOCUMENTS

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

#### DEFINITIONS

General: Basic Contract definitions are included in the Conditions of the Contract.

"Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.

"Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."

"Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."

"Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.

"Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.

"Install": Operations at Project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.

"Provide": Furnish and install, complete and ready for the intended use.

"Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

## INDUSTRY STANDARDS

Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.

Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.

Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.

1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.

## ABBREVIATIONS AND ACRONYMS

Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in Thomson Gale's "Encyclopedia of Associations" or in Columbia Books' "National Trade & Professional Associations of the U.S."

Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities, several of the more commonly referenced are listed below. If Contractor is unfamiliar with abbreviations referenced he may contact the Architect who has all of the referenced names, telephone numbers and web sites on file in his office. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

AAMA	American Architectural Manufacturers Association (847) 303-5664 <a href="http://www.aamanet.org">www.aamanet.org</a>	
AASHTO	American Association of State Highway and Transportation Officials <a href="http://www.transportation.org">www.transportation.org</a>	(202) 624-5800
ACI	ACI International (American Concrete Institute) <a href="http://www.aci-int.org">www.aci-int.org</a>	(248) 848-3700

AISC	American Institute of Steel Construction <a href="http://www.aisc.org">www.aisc.org</a> (312) 670-2400	(800) 644-2400
ANSI	American National Standards Institute <a href="http://www.ansi.org">www.ansi.org</a>	(202) 293-8020
ASHRAE	American Society of Heating, Refrigerating and Air- Conditioning Engineers <a href="http://www.ashrae.org">www.ashrae.org</a>	(800) 527-4723 (404) 636-8400
ASME	ASME International (The American Society of Mechanical Engineers International) <a href="http://www.asme.org">www.asme.org</a>	(800) 843-2763 (973) 882-1170
ASTM	ASTM International (American Society for Testing and Materials International) <a href="http://www.astm.org">www.astm.org</a>	(610) 832-9585
CRSI	Concrete Reinforcing Steel Institute <a href="http://www.crsi.org">www.crsi.org</a>	(847) 517-1200
CSI	Cast Stone Institute <a href="http://www.caststone.org">www.caststone.org</a>	(717) 272-3744
CSI	Construction Specifications Institute (The) <a href="http://www.csinet.org">www.csinet.org</a>	(800) 689-2900 (703) 684-0300
EIMA	EIFS Industry Members Association <a href="http://www.eima.com">www.eima.com</a>	(800) 294-3462 (770) 968-7945
HMMA	Hollow Metal Manufacturers Association (Part of NAAMM)	
IEC	International Electrotechnical Commission <a href="http://www.iec.ch">www.iec.ch</a>	41 22 919 02 11
IEEE	Institute of Electrical and Electronics Engineers, Inc. (The) <a href="http://www.ieee.org">www.ieee.org</a>	(212) 419-7900
NAAMM	National Association of Architectural Metal Manufacturers <a href="http://www.naamm.org">www.naamm.org</a>	(312) 332-0405
NEMA	National Electrical Manufacturers Association <a href="http://www.nema.org">www.nema.org</a>	(703) 841-3200

NFPA	NFPA (National Fire Protection Association) <a href="http://www.nfpa.org">www.nfpa.org</a>	(800) 344-3555 (617) 770-3000
NOFMA	NOFMA: The Wood Flooring Manufacturers Association (Formerly: National Oak Flooring Manufacturers Association) <a href="http://www.nofma.com">www.nofma.com</a>	(901) 526-5016
PCI	Precast/Prestressed Concrete Institute <a href="http://www.pci.org">www.pci.org</a>	(312) 786-0300
SGCC	Safety Glazing Certification Council <a href="http://www.sgcc.org">www.sgcc.org</a>	(315) 646-2234
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association <a href="http://www.smacna.org">www.smacna.org</a>	(703) 803-2980
SPIB	Southern Pine Inspection Bureau (The) <a href="http://www.spib.org">www.spib.org</a>	(850) 434-2611
SPRI	Single Ply Roofing Industry <a href="http://www.spri.org">www.spri.org</a>	(781) 647-7026
ADAAG	Americans with Disabilities Act (ADA)	(800) 872-2253

Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the standards and regulations in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

END OF SECTION 01420

## SECTION 01500 - TEMPORARY FACILITIES AND CONTROLS

### PART 1 – GENERAL

#### RELATED DOCUMENTS

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

#### SUMMARY

This Section includes requirements for temporary utilities, support facilities, and security and protection facilities.

Related Sections include the following:

1. Division 1 Section 01100 "Summary" for limitations on utility interruptions and other work restrictions.
2. Division 1 Section 01330 "Submittal Procedures" for procedures for submitting copies of implementation and termination schedule and utility reports.
3. Division 1 Section 01700 "Execution Requirements" for progress cleaning requirements.
4. Divisions 2 through 16 Sections for temporary heat, ventilation, and humidity requirements for products in those Sections.
5. Division 2 Section 02282 "Termite Control" for pest control.

#### DEFINITIONS

Permanent Enclosure: As determined by Architect, permanent or temporary roofing is complete, insulated, and weathertight; exterior walls are insulated and weathertight; and all openings are closed with permanent construction or substantial temporary closures.

#### USE CHARGES

General: Cost or use charges for temporary facilities shall be included in the Contract Sum. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Architect, testing agencies, and authorities having jurisdiction.

Sewer Service: Sewer connections will not be in place for most if not all of the duration of the project. When and if the off-site sewer is installed by others and sewer piping under this contract is installed, should the contractor decide to connect to the sewer he must pay all sewer use charges until the project is turned over to the Owner.

Water Service: Pay water service use charges for water used by all entities for construction operations.

Electric Power Service: Pay electric power service use charges for electricity used by all entities for construction operations.

## SUBMITTALS

Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.

## QUALITY ASSURANCE

Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.

Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

## PROJECT CONDITIONS

Temporary Use of Permanent Facilities: Installer of each permanent service shall assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

## PART 2 – PRODUCTS

### TEMPORARY FACILITIES

Field Offices, General: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading.

Common-Use Field Office: Of sufficient size to accommodate needs of construction personnel. Keep office clean and orderly. Furnish and equip offices as follows:



1. Furniture required for Project-site documents including file cabinets, plan tables, plan racks, and bookcases.
2. Conference room of sufficient size to accommodate meetings of 10 individuals. Provide electrical power service and 120-V ac duplex receptacles, with not less than 1 receptacle on each wall. Furnish room with conference table, chairs, and 4-foot- square tack board.
3. Drinking water and private toilet.
4. Coffee machine and supplies.
5. Heating and cooling equipment necessary to maintain a uniform indoor temperature of 68 to 72 deg F.
6. Lighting fixtures capable of maintaining average illumination of 20 fc at desk height.

Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.

1. Store combustible materials apart from building.

## EQUIPMENT

Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.

HVAC Equipment: Provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.

1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
2. Heating Units: Listed and labeled for type of fuel being consumed, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

## PART 3 – EXECUTION

### INSTALLATION, GENERAL

Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.

Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

## TEMPORARY UTILITY INSTALLATION

General: Install temporary service or connect to existing service.

1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services. Sanitary Sewers and Drainage: Provide temporary utilities to remove effluent lawfully.
2. Connect temporary sanitary sewer from construction office to a submerged temporary holding tank, as directed by authorities having jurisdiction.
3. Provide erosion control structures to drain storm water from site.

Water Service: Install water service and distribution piping in sizes and pressures adequate for construction from existing water lines in the street. Contractor shall pay for any metering costs and associated fees required by the City Water Department.

Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.

1. Toilets: Use of Owner's existing toilet facilities will not be permitted.

Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.

Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.

Electric Power Service: Provide temporary electric meter power service and distribution system of sufficient size, capacity, and power characteristics required for construction operations. Contractor shall be responsible for any charges associated with said service.

1. Install electric power service overhead, unless otherwise indicated.

Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.

1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.

Telephone Service: Provide temporary telephone service in common-use facilities for use by all construction personnel. Install one telephone line for each field office.

1. Provide additional telephone lines for the following:
  - a. Provide a dedicated telephone line for each facsimile machine and computer in each field office.
2. At each telephone, post a list of important telephone numbers.
  - a. Police and fire departments.
  - b. Ambulance service.
  - c. Contractor's home office.
  - d. Architect's office.
  - e. Engineers' offices.
  - f. Owner's office.
  - g. Principal subcontractors' field and home offices.
3. Provide superintendent with cellular telephone or portable two-way radio for use when away from field office.

Electronic Communication Service: Provide temporary electronic communication service, including electronic mail, in common-use facilities, or other suitable high speed internet connection.

1. Provide DSL in primary field office.

## SUPPORT FACILITIES INSTALLATION

General: Comply with the following:

1. Provide incombustible construction for offices, shops, and sheds located within construction area with good visibility of construction. Comply with NFPA 241.
2. Maintain support facilities until near Substantial Completion. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.

Traffic Controls: Comply with requirements of authorities having jurisdiction.

1. Protect existing site improvements to remain including curbs, pavement, and utilities.
2. Maintain access for fire-fighting equipment and access to fire hydrants.

Dewatering Facilities and Drains: Comply with requirements of authorities having jurisdiction. Maintain Project site, excavations, and construction free of water.

1. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining properties nor endanger permanent Work or temporary facilities.

Project Identification and Temporary Signs: Erect Project identification, General Contractor's sign, Architect's sign and other signs as approved. Install signs where directed to inform public and individuals seeking entrance to Project. Subcontractor signs are not permitted.

Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction. Comply with Division 1 Section "Execution Requirements" for progress cleaning requirements.

Temporary Stairs: Until permanent stairs are available, provide one temporary stair between floors, located near the center of the building.

Temporary Use of Permanent Stairs: Cover finished, permanent stairs with protective covering of plywood or similar material so finishes will be undamaged at time of acceptance.

## SECURITY AND PROTECTION FACILITIES INSTALLATION

Environmental Protection: Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.

1. Comply with work restrictions specified in Division 1 Section "Summary."

Temporary Erosion and Sedimentation Control: Comply with requirements specified in Division 2 02100 Section "Site Preparation."

Stormwater Control: Comply with authorities having jurisdiction. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of stormwater from heavy rains.

Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.

Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.

1. Where heating or cooling is needed and permanent enclosure is not complete, insulate temporary enclosures.

Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241.

1. Prohibit smoking in construction areas.
2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.
3. Develop and supervise an overall fire-prevention and protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.

## OPERATION, TERMINATION, AND REMOVAL

Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.

Maintenance: Maintain facilities in good operating condition until removal.

1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.

Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.

Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

1. Materials and facilities that constitute temporary facilities are property of Contractor. Carefully remove and turn over Architect's sign to the Architect.
2. Where area is intended for landscape development, in an area that has been used as a compacted temporary road bed, remove soil and aggregate fill that do not comply with requirements for landscaping fill or subsoil. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances that might impair growth of plant materials or lawns. Repair or replace street paving, curbs, and sidewalks at temporary entrances, as required by authorities having jurisdiction.
3. At Substantial Completion, clean and renovate permanent facilities used during construction period. Comply with final cleaning requirements specified in Division 1 Section 01770 "Closeout Procedures."

END OF SECTION 01500

## SECTION 01600 - PRODUCT REQUIREMENTS

### PART 1 – GENERAL

#### RELATED DOCUMENTS

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

#### SUMMARY

This Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; product substitutions; and equal products.

Related Sections include the following:

1. Divisions 2 through 16 Sections for specific requirements for warranties on products and installations specified to be warranted.

#### DEFINITIONS

Products: Items purchased for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.

1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature, that is current as of date of the Contract Documents.
2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
3. Equal Product: Product that is demonstrated and approved through submittal process, or where indicated as a product substitution, to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.

Basis-of-Design Product Specification: Where a specific manufacturer's product is named and accompanied by the words "basis of design," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating equal products of other named manufacturers.

## SUBMITTALS

Product List: Submit a list, in tabular form, showing specified products. Include generic names of products required. Include manufacturer's name and proprietary product names for each product.

1. Coordinate product list with Contractor's Construction Schedule and the Submittals Schedule.
2. Form: Tabulate information for each product under the following column headings:
  - a. Specification Section number and title.
  - b. Generic name used in the Contract Documents.
  - c. Proprietary name, model number, and similar designations.
  - d. Manufacturer's name and address.
  - e. Supplier's name and address.
  - f. Installer's name and address.
  - g. Projected delivery date or time span of delivery period.
  - h. Identification of items that require early submittal approval for scheduled delivery date.
3. Completed List: Within 60 days after date of commencement of the Work, submit 3 copies of completed product list. Include a written explanation for omissions of data and for variations from Contract requirements.
4. Architect's Action: Architect will respond in writing to Contractor within 15 days of receipt of completed product list. Architect's response will include a list of unacceptable product selections and a brief explanation of reasons for this action. Architect's response, or lack of response, does not constitute a waiver of requirement to comply with the Contract Documents.

Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.

1. Substitution Request Form: Use CSI Form 13.1A.
2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
  - a. Statement indicating why specified materials or products cannot be provided.



- b. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and separate contractors, that will be necessary to accommodate proposed substitution.
  - c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
  - d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
  - e. Samples, where applicable or requested.
  - f. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
  - g. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
  - h. Research/evaluation reports evidencing compliance with building code in effect for Project, from a model code organization acceptable to authorities having jurisdiction.
  - i. Detailed comparison of Contractor's Construction Schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating lack of availability or delays in delivery.
  - j. Cost information, including a proposal of change, if any, in the Contract Sum.
  - k. Contractor's certification that proposed substitution complies with requirements in the Contract Documents and is appropriate for applications indicated.
  - l. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within 7 days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or 7 days of receipt of additional information or documentation, whichever is later.
- a. Form of Acceptance: Change Order.
  - b. Use product specified if Architect cannot make a decision on use of a proposed substitution within time allocated.

- c. If Contractor's Substitution Requests are repeatedly (i.e. 3 times) submitted incomplete, i.e., no definitive response to items "a" through "l", the Architect will not consider any further Substitution Requests.

Equal Product Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.

1. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within one week of receipt of an equal product request. Architect will notify Contractor of approval or rejection of proposed equal product request within 15 days of receipt of request, or 7 days of receipt of additional information or documentation, whichever is later.
  - a. Use product specified if Architect cannot make a decision on use of an equal product request within time allocated.

Basis-of-Design Product Specification Submittal: Comply with requirements in Division 1 Section 01330 "Submittal Procedures." Show compliance with requirements.

## QUALITY ASSURANCE

Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, product selected shall be compatible with products previously selected, even if previously selected products were also options.

## PRODUCT DELIVERY, STORAGE, AND HANDLING

Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft. Comply with manufacturer's written instructions.

### Delivery and Handling:

1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.

4. Inspect products on delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.

Storage:

1. Store products to allow for inspection and measurement of quantity or counting of units.
2. Store materials in a manner that will not endanger Project structure.
3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
4. Store cementitious products and materials on elevated platforms.
5. Store foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
6. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
7. Protect stored products from damage and liquids from freezing.
8. Provide a secure location and enclosure at Project site for storage of materials and equipment by Owner's construction forces. Coordinate location with Owner.
9. Materials Stored Off Site: Unless otherwise provided in the Contract Documents, the Contractor's cost of materials and equipment to be incorporated into the Work, which are stored off the site, may also be considered in monthly Applications for Payment under the following conditions:
  - a. The contractor has received written approval from the Architect and Owner to store the materials or equipment off site in advance of delivering the materials to the off site location.
  - b. A Certificate of Insurance is furnished to the Architect evidencing that a special insurance policy, or rider to an existing policy, has been obtained by the Contractor providing all-risk property insurance coverage, specifically naming the materials or equipment stored, and naming the Owner as an additionally insured party.
  - c. The Architect is provided with a detailed inventory of the stored materials or equipment and the materials or equipment are clearly marked in correlation to the inventory to facilitate inspection and verification of the presence of the materials or equipment by the Architect or Owner.
  - d. The materials or equipment are properly and safely stored in a bonded warehouse, or a facility otherwise approved in advance by the Architect and Owner.

- e. Compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest.

## PRODUCT WARRANTIES

Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

1. Manufacturer's Warranty: Preprinted written warranty published by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
2. Special Warranty: Written warranty required by or incorporated into the Contract Documents, either to extend time limit provided by manufacturer's warranty or to provide more rights for Owner.

Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution. Submit a draft for approval before final execution.

1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
2. Refer to Divisions 2 through 16 Sections for specific content requirements and particular requirements for submitting special warranties.

Warranty start for mechanical and electrical equipment being date of substantial completion.

General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, that are new at time of installation.

1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.

4. Where products are accompanied by the term "as selected," Architect will make selection.
5. Where products are accompanied by the term "match sample," sample to be matched is Architect's.
6. Descriptive, performance, and reference standard requirements in the Specifications establish "salient characteristics" of products.
7. Or Equal: Where products are specified by name and accompanied by the term "or equal" or "or approved equal" or "or approved," comply with provisions in Part 2 "Equal Products" Article to obtain approval for use of an unnamed product.

#### Product Selection Procedures:

1. Products and Manufacturers: In particular instances there may only be a single product or manufacturer appropriate for use on the project, in which case where Specifications name a single product and manufacturer and say "no equal", provide the named product.
2. Products and Manufacturers: When one or two products or manufacturers are specified and have the words "or approved equal", the Contractor may propose to provide alternatives in the form of a Substitution Request which once reviewed by the Architect will be either accepted or rejected. If Substitution Request is submitted for approval 7 days prior to the receipt of bids and approved by the Architect, said approvals will be included in Addenda. Only those Substitution Requests listed as approved in Addenda may bid the project.
3. Products and Manufacturers: Where Specifications include a list of three (3) or more names of both products and manufacturers, provide one of the products listed that complies with requirements. No substitutions will be accepted.
4. Basis-of-Design Product: Where Specifications name a product and include a list of manufacturers, provide the specified product or an equal product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named.
5. Visual Matching Specification: Where Specifications require matching an established Sample, product must comply with all requirements and must match Architect's sample. Architect's decision will be final on whether a proposed product matches.
  - a. If no product available within specified category matches and complies with other specified requirements, comply with provisions in Part 2 "Product Substitutions" Article for proposal of product.

6. Visual Selection Specification: Where Specifications include the phrase "as selected from manufacturer's colors, patterns, textures" or a similar phrase, select a product that complies with other specified requirements.
  - a. Standard Range: Where Specifications include the phrase "standard range of colors, patterns, textures" or similar phrase, Architect will select color, pattern, density, or texture from manufacturer's product line that does not include premium items.
  - b. Full Range: Where Specifications include the phrase "full range of colors, patterns, textures" or similar phrase, Architect will select color, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

## PRODUCT SUBSTITUTIONS

Timing: Architect will consider requests for substitution under the conditions set forth in this section under Product Selection Procedures, if received within 60 days after the Notice to Proceed. Requests received after that time may be considered or rejected at discretion of Architect.

Conditions: Architect will consider Contractor's request for substitution under the conditions set forth in this section under Product Selection Procedures and when the following conditions are satisfied. If the following conditions are not satisfied,

Architect will return requests without action, except to record noncompliance with these requirements:

1. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
2. Requested substitution requires no or only very minor revisions (as determined by the Architect), to the Contract Documents.
3. Requested substitution is consistent with the Contract Documents and will produce indicated results.
4. Substitution request is fully documented and properly submitted.
5. Requested substitution will not adversely affect Contractor's Construction Schedule.
6. Requested substitution has received necessary approvals of authorities having jurisdiction.
7. Requested substitution is compatible with other portions of the Work.

8. Requested substitution has been coordinated with other portions of the Work.
9. Requested substitution provides specified warranty.
10. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

END OF SECTION 01600

## SECTION 01700 - EXECUTION REQUIREMENTS

### PART 1 – GENERAL

#### RELATED DOCUMENTS

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

#### SUMMARY

This Section includes general procedural requirements governing execution of the Work including, but not limited to, the following:

1. Construction layout.
2. Field engineering and surveying.
3. General installation of products.
4. Coordination of Owner-installed products.
5. Progress cleaning.
6. Starting and adjusting.
7. Protection of installed construction.
8. Correction of the Work.

Related Sections include the following:

1. Division 1 Section 01310 "Project Management and Coordination" for procedures for coordinating field engineering with other construction activities.
2. Division 1 Section 01330 "Submittal Procedures" for submitting surveys.
3. Division 1 Section 01770 "Closeout Procedures" for submitting Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.

#### SUBMITTALS

Qualification Data: For professional engineer.

Certificates: Submit certificate signed by professional engineer certifying that location and elevation of improvements comply with requirements.

Landfill Receipts: Submit copy of receipts issued by a landfill facility, licensed to accept hazardous materials, for hazardous waste disposal.



Certified Surveys: Submit two copies signed by professional engineer.

## QUALITY ASSURANCE

Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing land-surveying services of the kind indicated.

## PART 2 – EXECUTION

### EXAMINATION

Existing Conditions: The existence and location of site improvements, utilities, and other construction indicated as existing are not guaranteed. Before beginning work, investigate and verify the existence and location of mechanical and electrical systems and other construction affecting the Work.

1. Before construction, verify the location and points of connection of utility services.

Existing Utilities: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities and other construction affecting the Work.

1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; and underground electrical services.
2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.

Acceptance of Conditions: Examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.

1. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:
  - a. Description of the Work.
  - b. List of detrimental conditions, including substrates.
  - c. List of unacceptable installation tolerances.
  - d. Recommended corrections.
2. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.

3. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
4. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
5. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

## PREPARATION

Existing Utility Information: Furnish information to local utility and Owner that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.

Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents, submit a request for information to Architect. Include a detailed description of problem encountered, together with recommendations for changing the Contract Documents. Submit requests on RFI, "Request for Interpretation."

## CONSTRUCTION LAYOUT

Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Architect promptly.

General: Engage a professional engineer to lay out the Work using accepted surveying practices.

1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
2. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
3. Inform installers of lines and levels to which they must comply.

4. Check the location, level and plumb, of every major element as the Work progresses.
5. Notify Architect when deviations from required lines and levels exceed allowable tolerances.
6. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.

Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and invert elevations.

Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.

Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Architect.

## FIELD ENGINEERING

Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.

1. Do not change or relocate existing benchmarks or control points without prior written approval of Architect. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to Architect before proceeding.
2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.

Benchmarks: Establish and maintain a minimum of two permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.

1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
2. Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.

3. Remove temporary reference points when no longer needed.  
Restore marked construction to its original condition.

Certified Survey: On completion of foundation walls, major site improvements, and other work requiring field-engineering services, prepare a certified survey showing dimensions, locations, angles, and elevations of construction and sitework.

Final Property Survey: Submit a final property survey certifying exact locations of site improvements including building(s), parking lots, roadways and utilities including structure elevations, top and invert, distances from property lines, and with any variation from the original civil staking and layout and utility drawings identified.

## INSTALLATION

General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.

1. Make vertical work plumb and make horizontal work level.
2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
3. Conceal pipes, ducts, and wiring in finished areas, unless otherwise indicated.
4. Maintain minimum headroom clearance of 8 feet in spaces without a suspended ceiling unless shown otherwise on drawings.

Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.

Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.

Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.

Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.

Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.

Anchors and Fasteners: Provide anchors and fasteners as required to anchor each component securely in place, accurately located and aligned with other portions of the Work.

1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
2. Allow for building movement, including thermal expansion and contraction.
3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.

Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

#### OWNER-INSTALLED PRODUCTS

Site Access: Provide access to Project site for Owner's construction forces.

Coordination: Coordinate construction and operations of the Work with work performed by Owner's construction forces.

1. Construction Schedule: Inform Owner of Contractor's preferred construction schedule for Owner's portion of the Work. Adjust construction schedule based on a mutually agreeable timetable. Notify Owner if changes to schedule are required due to differences in actual construction progress.
2. Pre-installation Conferences: Include Owner's construction forces at pre-installation conferences covering portions of the Work that are to receive Owner's work. Attend pre-installation conferences conducted by Owner's construction forces if portions of the Work depend on Owner's construction.

#### PROGRESS CLEANING

General: Clean Project site and work areas daily, including common areas. Coordinate progress cleaning for joint-use areas where more than one installer has worked. Enforce requirements strictly. Dispose of materials lawfully.

1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
2. Do not hold materials more than 7 days during normal weather or 3 days if the temperature is expected to rise above 80 deg F.
3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.

Site: Maintain Project site free of waste materials and debris.

Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.

1. Remove liquid spills promptly.
2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.

Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.

Concealed Spaces: Remove debris from concealed spaces before enclosing the space.

Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

Waste Disposal: Burying or burning waste materials on-site will not be permitted. Washing waste materials down sewers or into waterways will not be permitted.

During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

## STARTING AND ADJUSTING

Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.

Adjust operating components for proper operation without binding. Adjust equipment for proper operation.

Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

Manufacturer's Field Service: If a factory-authorized service representative is required to inspect field-assembled components and equipment installation, comply with qualification requirements in Division 1 Section 01400 "Quality Requirements."

## PROTECTION OF INSTALLED CONSTRUCTION

Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

Comply with manufacturer's written instructions for temperature and relative humidity.

## CORRECTION OF THE WORK

Repair or remove and replace defective construction. Restore damaged substrates and finishes.

1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.

Restore permanent facilities used during construction to their specified condition.

Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.

Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.

Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION 01700

## SECTION 01770 - CLOSEOUT PROCEDURES

### PART 1 – GENERAL

#### RELATED DOCUMENTS

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

#### SUMMARY

This Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:

1. Inspection procedures.
2. Warranties.
3. Final cleaning.

Related Sections include the following:

1. Division 1 Section 01290 "Payment Procedures" for requirements for Applications for Payment for Substantial and Final Completion.
2. Division 1 Section 01322 "Photographic Documentation" for submitting Final Completion construction photographs and negatives.
3. Division 1 Section 01700 "Execution Requirements" for progress cleaning of Project site.
4. Division 1 Section 01781 "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.
5. Division 1 Section 01782 "Operation and Maintenance Data" for operation and maintenance manual requirements.
6. Division 1 Section 01720 "Demonstration and Training" for requirements for instructing Owner's personnel.
7. Divisions 2 through 16 Sections for specific closeout and special cleaning requirements for the Work in those Sections.

#### SUBSTANTIAL COMPLETION

Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete in request.



1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
2. Advise Owner of pending insurance changeover requirements.
3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
5. Prepare and submit Project Record Documents, operation and maintenance manuals, Final Completion construction photographs, damage or settlement surveys, property surveys, and similar final record information.
6. Deliver spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
7. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
8. Complete startup testing of systems.
9. Submit test/adjust/balance records.
10. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
11. Advise Owner of changeover in heat and other utilities.
12. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
13. Complete final cleaning requirements, including touchup painting.
14. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.

1. Re-inspection: Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected.
2. Results of completed inspection will form the basis of requirements for Final Completion.

## FINAL COMPLETION

Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:

1. Submit a final Application for Payment according to Division 1 Section 01290 "Payment Procedures."
2. Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
4. Submit pest-control final inspection report and warranty.
5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training videotapes.

Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

1. Re-inspection: Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected.

#### LIST OF INCOMPLETE ITEMS (PUNCH LIST)

Preparation: Submit three copies of list. Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.

1. Mark the Architect's punchlist so as to identify those items that are still outstanding and uncorrected at the time of submission.

#### WARRANTIES

Submittal Time: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated.

Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.

1. Bind warranties and bonds in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.

2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.

Provide additional copies of each warranty to include in operation and maintenance manuals.

## PART 2 – PRODUCTS

### MATERIALS

Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

## PART 3 – EXECUTION

### FINAL CLEANING

General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.

1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for Project.
  - a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
  - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
  - c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.

- d. Remove tools, construction equipment, machinery, and surplus material from Project site.
- e. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
- f. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
- g. Sweep concrete floors broom clean in unoccupied spaces.
- h. Vacuum carpet and similar soft surfaces, removing debris and excess nap; shampoo if visible soil or stains remain.
- i. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.
- j. Remove labels that are not permanent.
- k. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.
  - 1) Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.
- l. Wipe surfaces of mechanical and electrical equipment, elevator equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
- m. Replace parts subject to unusual operating conditions.
- n. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
- o. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
- p. Clean ducts, blowers, and coils if units were operated without filters during construction.
- q. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs, and those noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.
- r. Leave Project clean and ready for occupancy.

Pest Control: Engage an experienced, licensed exterminator to make a final inspection and rid Project of rodents, insects, and other pests. Prepare a report.

Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.

END OF SECTION 01770

## SECTION 01781 - PROJECT RECORD DOCUMENTS

### PART 1 – GENERAL

#### RELATED DOCUMENTS

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

#### SUMMARY:

This Section includes administrative and procedural requirements for Project Record Documents, including the following:

1. Digital Record Drawings.
2. Digital Record Specifications.
3. Digital Record Product Data.

Related Sections include the following:

1. Division 1 Section 01770 "Closeout Procedures" for general closeout procedures.
2. Division 1 Section 01782 "Operation and Maintenance Data" for operation and maintenance manual requirements.
3. Divisions 2 through 16 Sections for specific requirements for Project Record Documents of the Work in those Sections.

#### SUBMITTALS:

Record Drawings: Comply with the following:

1. Number of Copies: Submit one set of digitally scanned marked-up Record Prints.

Record Specifications: Submit one copy of digitally scanned Project Specifications, including addenda and contract modifications.

Record Product Data: Submit one digitally scanned copy of each Product Data submittal.

Where Record Product Data is required as part of operation and maintenance manuals, submit marked-up Product Data as an insert in manual instead of submittal as Record Product Data.

## PART 2 – PRODUCTS

### RECORD DRAWINGS

Record Prints: Maintain one clean set of blue- or black-line white prints of the Contract Drawings and Shop Drawings and one copy of the project manual (specification) at the job site for the sole purpose of recording changes to the drawings and specifications.

Preparation: Mark Record Prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to prepare the marked-up Record Prints.

1. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
2. Accurately record information in an understandable drawing technique.
3. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.

Content: Types of items requiring marking include, but are not limited to, the following:

1. Dimensional changes to Drawings.
2. Revisions to details shown on Drawings.
3. Depths of foundations below first floor.
4. Locations and depths of underground utilities.
5. Revisions to routing of piping and conduits.
6. Revisions to electrical circuitry.
7. Actual equipment locations.
8. Duct size and routing.
9. Locations of concealed internal utilities.
10. Changes made by Change Order or Construction Change Directive. (Posted on Documents.)
11. Changes made following Architect's written orders, i.e. ASIs. (Posted on Documents.)
12. Details not on the original Contract Drawings. (Posted on Documents.)
13. Field records for variable and concealed conditions.
14. Record information on the Work that is shown only schematically.
15. Changes made in response to Contractor's questions, i.e. RFIs. (Posted on Documents.)

Mark the Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions, completely and accurately. If Shop Drawings are marked, show cross-reference on the Contract Drawings.

Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.

Mark important additional information that was either shown schematically or omitted from original Drawings.

Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable. Where posting is required, post on Drawing Set and in Specifications on sheets or pages adjacent to or on top of where modification applies. Attachment method shall be taped at top only, so as to access original underneath.

Digitally scan all documents and provide on CD Rom to Architect.

#### RECORD SPECIFICATIONS

Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications. Maintain one clean copy of the project manual (specification) at the job site for the sole purpose of recording changes to the drawings and specifications.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
4. For each principal product, indicate whether Record Product Data has been submitted in operation and maintenance manuals instead of submitted as Record Product Data.
5. Note related Change Orders, Record Product Data, and Record Drawings where applicable.

Digitally scan all documents and provide on CD Rom to Architect.

#### RECORD PRODUCT DATA

Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.



Maintain one clean set at the job site for the sole purpose of recording changes to the drawings and specifications.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
3. Note related Change Orders, Record Specifications and Record Drawings where applicable.

Digitally scan all documents and provide on CD Rom to Architect.

#### MISCELLANEOUS RECORD SUBMITTALS

Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

#### PART 3 - RECORDING AND MAINTENANCE

Recording: Maintain one copy of each submittal during the construction period for Project Record Document purposes. Post changes and modifications to Project Record Documents as they occur; do not wait until the end of Project.

Maintenance of Record Documents and Samples: Store Record Documents and Samples in the field office apart from the Contract Documents used for construction. Do not use Project Record Documents for construction purposes. Maintain Record Documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to Project Record Documents for Architect's reference during normal working hours. Architect's representative will review Record Documents with the project superintendent each month to determine to his satisfaction whether or not Record Documents are being kept up to date. Failure to do so will result in the delay of processing pay request until Record Documents are brought up to date.

END OF SECTION 01781

## SECTION 01782 - OPERATION AND MAINTENANCE DATA

### PART 1 – GENERAL

#### RELATED DOCUMENTS

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

#### SUMMARY

This Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:

1. Operation and maintenance documentation directory.
2. Emergency manuals.
3. Operation manuals for systems, subsystems, and equipment.
4. Maintenance manuals for the care and maintenance of products, materials, finishes, systems and equipment.

Related Sections include the following:

1. Division 1 Section 01330 "Submittal Procedures" for submitting copies of submittals for operation and maintenance manuals.
2. Division 1 Section 01770 "Closeout Procedures" for submitting operation and maintenance manuals.
3. Division 1 Section 01781 "Project Record Documents" for preparing Record Drawings for operation and maintenance manuals.
4. Divisions 2 through 16 Sections for specific operation and maintenance manual requirements for the Work in those Sections.

#### DEFINITIONS

System: An organized collection of parts, equipment, or subsystems united by regular interaction.

Subsystem: A portion of a system with characteristics similar to a system.

#### SUBMITTALS

Submittal: Submit one copy of each manual in final form at least 15 days before final inspection. Architect will return copy with comments within 15 days after final inspection.

1. Correct or modify each manual to comply with Architect's comments. Submit three copies of each corrected manual within 15 days of receipt of Architect's comments.

## COORDINATION

Where operation and maintenance documentation includes information on installations by more than one factory-authorized service representative, assemble and coordinate information furnished by representatives and prepare manuals.

## PART 2 – PRODUCTS

### OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY

Organization: Include a section in the directory for each of the following:

1. List of documents.
2. List of systems.
3. List of equipment.
4. Table of contents.

List of Systems and Subsystems: List systems alphabetically. Include references to operation and maintenance manuals that contain information about each system.

List of Equipment: List equipment for each system, organized alphabetically by system. For pieces of equipment not part of system, list alphabetically in separate list.

Tables of Contents: Include a table of contents for each emergency, operation, and maintenance manual.

Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

## MANUALS, GENERAL

Organization: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:

1. Title page.
2. Table of contents.
3. Manual contents.

Title Page: Enclose title page in transparent plastic sleeve. Include the following information:

1. Subject matter included in manual.
2. Name and address of Project.
3. Name and address of Owner.
4. Date of submittal.
5. Name, address, and telephone number of Contractor.
6. Name and address of Architect.
7. Cross-reference to related systems in other operation and maintenance manuals.

Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.

1. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.

Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.

1. Binders: Heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.
  - a. If two or more binders are necessary to accommodate data of a system, organize data in each binder into groupings by subsystem and related components. Cross-reference other binders if necessary to provide essential information for proper operation or maintenance of equipment or system.
  - b. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, and subject matter of contents. Indicate volume number for multiple-volume sets.

2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.
3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software diskettes for computerized electronic equipment.
4. Supplementary Text: Prepared on 8-1/2-by-11-inch white bond paper.
5. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.
  - a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
  - b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

## EMERGENCY MANUALS

Content: Organize manual into a separate section for each of the following:

1. Type of emergency.
2. Emergency instructions.
3. Emergency procedures.

Type of Emergency: Where applicable for each type of emergency indicated below, include instructions and procedures for each system, subsystem, piece of equipment, and component:

1. Fire.
2. Flood.
3. Gas leak.
4. Water leak.
5. Power failure.
6. Water outage.
7. System, subsystem, or equipment failure.
8. Chemical release or spill.

Emergency Instructions: Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of Owner's operating personnel for notification of Installer, supplier, and manufacturer to maintain warranties.

Emergency Procedures: Include the following, as applicable:

1. Instructions on stopping.
2. Shutdown instructions for each type of emergency.
3. Operating instructions for conditions outside normal operating limits.
4. Required sequences for electric or electronic systems.
5. Special operating instructions and procedures.

## OPERATION MANUALS

Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:

1. System, subsystem, and equipment descriptions.
2. Performance and design criteria if Contractor is delegated design responsibility.
3. Operating standards.
4. Operating procedures.
5. Operating logs.
6. Wiring diagrams.
7. Control diagrams.
8. Piped system diagrams.
9. Precautions against improper use.
10. License requirements including inspection and renewal dates.

Descriptions: Include the following:

1. Product name and model number.
2. Manufacturer's name.
3. Equipment identification with serial number of each component.
4. Equipment function.
5. Operating characteristics.
6. Limiting conditions.
7. Performance curves.
8. Engineering data and tests.
9. Complete nomenclature and number of replacement parts.

Operating Procedures: Include the following, as applicable:

1. Startup procedures.
2. Equipment or system break-in procedures.
3. Routine and normal operating instructions.
4. Regulation and control procedures.
5. Instructions on stopping.
6. Normal shutdown instructions.

7. Seasonal and weekend operating instructions.
8. Required sequences for electric or electronic systems.
9. Special operating instructions and procedures.

Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.

Piped Systems: Diagram piping as installed, and identify color-coding where required for identification.

## PRODUCT MAINTENANCE MANUAL

Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.

Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.

Product Information: Include the following, as applicable:

1. Product name and model number.
2. Manufacturer's name.
3. Color, pattern, and texture.
4. Material and chemical composition.
5. Reordering information for specially manufactured products.

Maintenance Procedures: Include manufacturer's written recommendations and the following:

1. Inspection procedures.
2. Types of cleaning agents to be used and methods of cleaning.
3. List of cleaning agents and methods of cleaning detrimental to product.
4. Schedule for routine cleaning and maintenance.
5. Repair instructions.

Repair Materials and Sources: Include lists of materials and local sources of materials and related services.

Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

1. Include procedures to follow and required notifications for warranty claims.

## SYSTEMS AND EQUIPMENT MAINTENANCE MANUAL

Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.

Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.

Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:

1. Standard printed maintenance instructions and bulletins.
2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
3. Identification and nomenclature of parts and components.
4. List of items recommended to be stocked as spare parts.

Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:

1. Test and inspection instructions.
2. Troubleshooting guide.
3. Precautions against improper maintenance.
4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
5. Aligning, adjusting, and checking instructions.
6. Demonstration and training videotape, if available.



Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.

1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.

Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.

Maintenance Service: Some equipment and products require maintenance by the manufacturer, supplier or subcontractor, i.e., an authorized service representative, as part of the warranty. The General Contractor shall ensure that said maintenance work is done and provide copies of service reports to the Owner.

Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

1. Include procedures to follow and required notifications for warranty claims.

## PART 3 – EXECUTION

### MANUAL PREPARATION

Operation and Maintenance Documentation Directory: Prepare a separate manual that provides an organized reference to emergency, operation, and maintenance manuals.

Emergency Manual: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by Owner's operating personnel for types of emergencies indicated.

Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.

Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.

1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.

Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.

1. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.

Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in Record Drawings to ensure correct illustration of completed installation.

1. Do not use original Project Record Documents as part of operation and maintenance manuals.
2. Comply with requirements of Record Drawings in Division 1 Section 01781 "Project Record Documents."

Comply with Division 1 Section 01770 "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

END OF SECTION 01782

## SECTION 01820 - DEMONSTRATION AND TRAINING

### PART 1 – GENERAL

#### RELATED DOCUMENTS

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

#### SUMMARY

This Section includes administrative and procedural requirements for instructing Owner's personnel, including the following:

1. Demonstration of operation of systems, subsystems, and equipment.
2. Training in operation and maintenance of systems, subsystems, and equipment.
3. Demonstration and training videotapes.

Related Sections include the following:

1. Division 1 Section 01310 "Project Management and Coordination" for requirements for pre-instruction conferences.
2. Divisions 2 through 16 Sections for specific requirements for demonstration and training for products in those Sections.

#### SUBMITTALS

Instruction Program: Submit two copies of outline of instructional program for demonstration and training, including a schedule of proposed dates, times, length of instruction time, and instructors' names for each training module. Include learning objective and outline for each training module.

1. At completion of training, submit one complete training manual for Owner's use.

#### QUALITY ASSURANCE

Instructor Qualifications: A factory-authorized service representative, complying with requirements in Division 1 Section 01400 "Quality Requirements," experienced in operation and maintenance procedures and training.

## COORDINATION

Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations.

Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.

Coordinate content of training modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data has been reviewed and approved by Architect.

## PART 2 – PRODUCTS

### INSTRUCTION PROGRAM

Program Structure: Develop an instruction program that includes individual training modules for each system and equipment not part of a system, as required by individual Specification Sections.

## PART 3 – EXECUTION

### PREPARATION

Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a combined training manual.

Set up instructional equipment at instruction location.

### INSTRUCTION

Instructor: Engage a qualified instructor to prepare instruction program and training modules, and to coordinate between Contractor and Owner for number of participants, instruction times, and location.

Instructor shall demonstrate to Owner's personnel how to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.

Scheduling: Provide instruction at mutually agreed on times. For equipment that requires seasonal operation, provide similar instruction at start of each season.

1. Schedule training with Owner, through Architect, with at least seven days' advance notice.

END OF SECTION 01820

## SECTION 02070 - SELECTIVE DEMOLITION

### PART 1 - GENERAL

#### RELATED DOCUMENTS

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

#### DESCRIPTION OF WORK

Extent of demolition work is shown on drawings, as well as all items necessary to complete new work indicated on plans.

Schedule of Demolition Work: Demolition includes but is not limited to the following:

1. Any damage to existing facilities at the site after the Contractor takes possession shall be repaired by this Contractor at his expense.
2. Contractor shall replace grass/sod damaged during the construction. Fill in ruts caused by equipment with topsoil and grass over to match existing conditions.
3. As indicated on the Drawings.
4. All other items indicated required to be demolished to complete new work.

#### SUBMITTALS

Schedule: Submit proposed methods and operations of demolition work to Architect for review prior to start of work. Include in schedule coordination for shut-off, capping and continuation of utility services as required.

1. Provide a detailed sequence of demolition and removal work to ensure uninterrupted progress of Owner's on-site operations.

#### JOB CONDITIONS

Condition of Structures: Conditions existing at time of inspection for bidding purposes will be maintained by Owner in so far as practicable.

Explosives: Use of explosives will not be permitted.

Traffic: Conduct demolition operations and removal of debris to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities.

Do not close or obstruct streets, walks or other occupied or used facilities without permission from authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.

Protections: Ensure safe passage of persons (night or day) around area of demolition. Conduct operations to prevent injury to adjacent buildings, structures, other facilities and persons.

1. Erect temporary covered passageways as required by authorities having jurisdiction.
2. Provide temporary fencing as necessary to secure the limits of construction. Fencing shall be substantial to deter passage, fencing material shall be at Contractors discretion.

Damages: Promptly repair damages caused to adjacent facilities by demolition operations at no cost to Owner.

Utility Services: Maintain existing utilities indicated to remain, keep in service, and protect against damage during demolition operations.

1. Do not interrupt existing utilities serving occupied or used facilities, except when authorized in writing by authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to governing authorities.
2. All electrical work to be removed, relocated or reconnected shall be preformed by a licensed Electrical Contractor in accordance with the NEC and any applicable local codes and ordinances.

## PART 2 - PRODUCTS - NOT APPLICABLE

## PART 3 - EXECUTION

### DEMOLITION

### DISPOSAL OF DEMOLISHED MATERIALS

General: Remove from site debris, rubbish and other materials resulting from demolition operations.

Burning of removed materials from demolished structures will not be permitted on site.

Removal: Transport materials removed from demolished structures and legally dispose of off site, in area approved by all local authorities and ADEM.

END OF SECTION 02070

## SECTION 02100 - SITE PREPARATION

### PART 1 – GENERAL

#### RELATED DOCUMENTS

Drawings and general provisions of the contract including General and Supplementary Conditions and Division 1 Specification Sections apply to work of this section.

#### DESCRIPTION OF WORK

Perform site preparation work as shown and specified. Site preparation includes, but is not limited to:

1. Protection of existing trees to remain
2. Removal of trees and other vegetation
3. Stripping and stockpiling of topsoil
4. Clearing and grubbing
5. Removing above grade improvements
6. Removing below grade improvements
7. Installation of erosion control devices

#### JOB CONDITIONS

Protection of Existing Trees and Vegetation: Protect existing trees and other vegetation indicated to remain in place, against unnecessary cutting, breaking or skinning of roots, skinning and bruising of bark, smothering of trees by stockpiling construction materials or excavated materials within drip line, excess foot or vehicular traffic, or parking of vehicles within drip line. Provide temporary guards to protect trees and vegetation to be left standing. Leave all protection in place and maintain until construction work has been completed and all danger of damage has passed. Protection shall be removed only after approval is given by Architect.

#### QUALITY ASSURANCE:

**The General Contractor shall obtain (*In accordance with ADEM Admin. Code Chapter 335-6-12*) an ADEM storm water permit from the State of Alabama. An NPDES construction site also includes construction sites, irrespective of size, whose stormwater discharges have a reasonable potential to be a significant contributor of pollutants to a water of the State, or whose stormwater discharges have a reasonable potential to cause or contribute to a violation of an applicable Alabama water quality standard as determined by the Department. The General Contractor shall include in Base Bid all permit fees associated to obtain this permit. The Contractor shall submit a Notice of Registration, the fee and develop a Construction**



**Best Management Practices Plan (CBMPP) prior to construction and shall maintain all erosion control measures until the permit is relinquished.**

The Contractor shall use care when working near existing and future installed Best Management Practice (BMP) structures to prevent damage to the structures resulting in erosion and storm water runoff containing silt and soil from the site. The Contractor shall walk the site and verify the condition of the BMP structures during the execution of the work. Any repair work that is deemed necessary as a result of damage caused by the Contractor shall be the responsibility of the Contractor and shall be performed prior to payment of the next scheduled payment application.

## PART 2 – PRODUCTS

### MATERIALS

Temporary Soil Erosion and Sediment Control Items: Items including silt fence, wattles, inlet protection, sand bags and other erosion control items are to meet the requirements of Section 665 of the Alabama Department of Transportation Standard Specifications for Highway Construction (ALDOTSSHC), latest edition.

## PART 3 – EXECUTION

### EROSION CONTROL

Prior to the starting of any work, install erosion control measures as required in the Erosion Control or Best Management Practice Plan. Maintain all erosion control measures in place during full construction period and until such time as the site is substantially vegetated. Install erosion control measures in accordance with Section 665 of the Alabama Department of Transportation Standard Specifications for Highway Construction (ALDOTSSHC), latest edition, and the manufacturer's recommendations. Inspection of the silt fence shall be daily, and repair or replacement must be made promptly as required. Any sediment collected by the erosion control measures must be removed when it reaches 6" in height. Erosion control measures shall be removed only after approval is given by the Architect. Removal of erosion control measures is to be carried out by the Contractor who installed the measures.

### SITE CLEARING

General: Remove vegetation, improvements or obstructions interfering with installation of new construction and within limits indicated on the Drawings. Remove all demolished items from the site. Removal includes digging out stumps and roots. Carefully and cleanly cut roots and branches of trees

indicated to be left standing where such roots and branches obstruct new construction.

Clearing and Grubbing: Clear site of trees, shrubs and other vegetation, except for those indicated to be left standing. Completely remove stumps, roots and other debris protruding through ground surface. Do not grub inside the drip line of trees to remain. On site burning is not permitted.

Fill depressions caused by clearing and grubbing operations with satisfactory soil material, unless further excavation or earthwork is indicated. Place fill material in horizontal layers not exceeding 8" loose depth and thoroughly compact to a density equal to adjacent original ground.

Positive drainage must be maintained or installed by the Contractor to insure that storm water runoff flows to the proper drainage structure or swale.

Restore all areas disturbed by construction activities and which are outside the limits of clearing as indicated on the drawing to their original condition. The expense for this work will be borne by the contractor. The work must be in accordance with the directions of the Architect.

#### STRIPPING TOPSOIL

Topsoil is defined as friable clay loam surface soil found in a depth of not less than 4". Satisfactory topsoil is reasonably free of subsoil, clay lumps, stones and other objects over 2" in diameter, and without weeds, roots and other objectionable material. Strip topsoil to its full depth at all areas to be regraded, resurfaced or paved in a manner to prevent intermingling with underlying subsoil or other objectionable material. Remove heavy growths of grass from areas before stripping. Where trees are indicated to be left standing, stop topsoil stripping at drip line, unless directed otherwise, to prevent damage to main root system. Stockpile topsoil in storage piles in a location acceptable to the Architect. Construct storage piles to freely drain surface water. Cover storage piles if required to prevent wind-blown dust. Maintain topsoil storage piles separate from other stockpiled soil materials.

#### SITE IMPROVEMENTS

Remove above grade and below grade improvements necessary to permit construction, and other work as indicated. Abandonment or removal of certain underground pipe or conduits are shown on the civil drawings and is included under work of those sections. Removal of abandoned underground piping or conduit interfering with construction is included under this section.

## DISPOSAL OF WASTE MATERIAL

Removal from Owner's Property: Remove waste materials, including unacceptable excavated materials, trash and debris, and legally dispose of it off Owner's property site, in area approved by all local authorities and ADEM.

END OF SECTION 02100

## SECTION 02200 – EARTHWORK

### PART 1 – GENERAL

#### RELATED DOCUMENTS:

Drawings and general provisions of the contract including General and Supplementary Conditions and Division 1 Specification Sections apply to work of this section.

#### DESCRIPTION OF WORK:

Extent of earthwork is indicated on drawings.

1. Rough grading
2. Preparation of subgrade for building slabs and walks is included as part of this work.
3. Drainage fill course for support of building slabs is included as part of this work.

Excavation for Mechanical/Electrical Work: Refer to Division 15 and 16 sections for excavation and backfill required in conjunction with underground mechanical and electrical utilities, and buried mechanical and electrical appurtenances; not work of this section.

Codes and Standards: Perform excavation work in compliance with applicable requirements of governing authorities having jurisdiction.

#### Testing and Inspection Service:

The **Owner** will select a firm for soil testing and inspection service for quality control testing during earthwork, and Owner to pay costs.

Retesting of rejected materials and installed work shall be done at the Contractor's expense.

Referenced Standards: Where the term "Referenced Standard" is used in these Project Specifications, it shall be interpreted as **referring to the current edition of "Standard Specifications for Highway Construction, 2018 or latest edition" of Alabama Department of Transportation** ". Referenced Divisions of the "Standard" are hereby made a part of this Project Specification insofar as they may be termed applicable. In no case will requirements for "Method of Measurement" and "Basis of Payment" be considered as applicable to this Project Specification.

#### JOB CONDITIONS:

Existing Utilities: Locate existing underground utilities in areas of work. If utilities are to remain in place, provide adequate means of support and protection during earthwork operations.

Should uncharted or incorrectly charted, piping or other utilities be encountered during excavation, consult utility Owner immediately for directions. Cooperate with Owner and utility companies in keeping respective services and facilities in operation. Repair damaged utilities to satisfaction of utility owner.

Use of Explosives: The use of explosives is not permitted.

Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout and other hazards created by earthwork operations.

1. Perform excavation within drip-line of large trees to remain by hand, and protect the root system from damage or dryout to the greatest extent possible. Maintain moist condition for root system and cover exposed roots with burlap. Paint root cuts of 1" diameter and larger with emulsified asphalt tree paint.

## PART 2 – PRODUCTS

## PART 3 – EXECUTION

### GENERAL:

Prior to the start of excavation and fill placement, the site should be cleared of existing improvements. Additionally, remnant elements associated with previously demolished structures, should be removed. Demolition should include removal of pavements, slabs, and all below grade structures including basement slabs, foundations, and walls. Utility lines will require grouting or removal, as appropriate.

Vegetation, topsoil, rootmat, and all organic materials should be completely removed from the site. Excavations resulting from demolition and vegetation removal should be backfilled in a controlled manner with engineered fill.

### Fill Placement

All material used as structural fill should be relatively free of organics and other deleterious materials. Soil fill should exhibit a Liquid Limit less than 50, a Plasticity Index less than 30, and a maximum dry density of at least 100 pcf. Soil fill should contain no more than 30% rock, and individual rock fragments in the fill should be less than 4 inches in largest dimension.

Soil fill must be placed in an environment free of excess water. Therefore, free-draining granular material (such as ALDOT # 57 crushed aggregate) should be used as the initial lift(s) of fill in areas containing water seepage.

Soil fill should be placed in lifts not exceeding eight inches in loose measure. Individual lifts of fill should be moisture conditioned to with  $\pm 2\%$  of the optimum moisture content and compacted to a minimum of 98% of the Standard Proctor (ASTM D -698) maximum dry density. Soil may require wetting or drying to achieve proper compaction. Thinner lifts and manually operated equipment will be required to achieve proper compaction in limited access areas such as utility trenches and around manholes and inlets.

Soil compaction testing should be performed during fill placement. Testing will give an indication of the contractor's performance with regard to soil density and moisture content requirements established in the project specifications. Compaction testing should be performed at random locations on each lift of fill placed to provide statistically relevant testing data. The frequency of density testing should be at least one test per lift for every 2,500 square feet of fill placed in building areas and 10,000 square feet in pavement and sidewalk areas (minimum of 3 tests per lift). Each lift of fill placed in utility trenches should be tested on 50-foot centers. A minimum of 3 tests should be performed on all fill lifts.

Following construction, the foundations and underlying soils should be isolated from sources of excess water. Grades adjacent to the structure should be adjusted so that surface water flows away from the foundations. In no case should water be allowed to pond over newly-constructed footings. Roof drains and downspouts from the new buildings should be directed away from the foundations. Additionally, soils adjacent to foundations should consist of properly compacted, engineered fill to minimize water infiltration. The on-site soils contained fine-grained particles and will be adversely affected by excess water.

To reduce the potential for water migration through the floor slab, ground-supported slabs should be underlain by a capillary break consisting of a minimum of 4 inches of compacted, free-draining, coarse, granular material (such as ALDOT #57 crushed stone). Depending on the type of floor coverings to be used, the owner may also elect install a vapor barrier typically consisting of 10 mil polyethylene sheeting. The sheeting will reduce the infiltration of water vapor through the slab and the potential for damage to floor coverings. Note, that the use of a vapor barrier will increase the potential for plastic shrinkage cracking during curing of the concrete slab.

#### EXCAVATION:

Excavation is Unclassified, and includes excavation to subgrade elevations indicated, regardless of character of materials and obstructions encountered.

Earth Excavation includes excavation of pavements and other obstructions visible on ground surface; underground structures, utilities and other items indicated to be demolished and removed; together with earth and other materials encountered that are not classified as rock or unauthorized excavation.

Unauthorized excavation consists of removal of materials beyond indicated subgrade elevations or dimensions without specific direction of Architect/Engineer. Unauthorized excavation, as well as remedial work directed by Architect/Engineer, shall be at Contractor's expense.

Under footings, foundation bases, or retaining walls, fill unauthorized excavation by extending indicated bottom elevation of footing or base to excavation bottom, without altering required top elevation. Lean concrete fill may be used to bring elevations to proper position, when acceptable to Architect/Engineer.

Elsewhere, backfill and compact unauthorized excavations as specified for authorized excavations of same classification, unless otherwise directed by Architect/Engineer.

Additional Excavation: When excavation has reached required sub-grade elevations, notify Architect/Engineer who will make an inspection of conditions.

If unsuitable bearing materials are encountered at required subgrade elevations, carry excavations deeper and replace excavated material as directed by Architect/Engineer.

Removal of unsuitable material and its replacement as directed will be paid on basis of contract conditions relative to changes in work.

Stability of Excavations: Slope sides of excavations to comply with local codes and ordinances having jurisdiction. Shore and brace where sloping is not possible because of space restrictions or stability of material excavated.

Maintain sides and slopes of excavations in safe condition until completion of backfilling.

Dewatering: See civil drawings for drainage plan recommendation for controlling ground water during initial construction phase. Prevent surface water from flowing into excavations and from flooding project site and surrounding area.

Do not allow water to accumulate in excavations. Remove water to prevent softening of foundation bottoms, undercutting footings, and soil changes detrimental to stability of subgrades and foundations. Provide and maintain pumps, well points, sumps, suction and discharge lines, and other dewatering system components necessary to convey water away from excavations.

Establish and maintain temporary drainage ditches and other diversions outside excavation limits to convey rainwater and water removed from excavations to collecting or run-off areas. Do not use trench excavations as temporary drainage ditches.

Material Storage: Stockpile satisfactory excavated materials where directed, until required for backfill or fill. Place, grade and shape stockpiles for proper drainage.

Locate and retain soil materials away from edge of excavations. Do not store within drip line of trees indicated to remain.

Dispose of excess soil material and waste materials as herein specified.

Excavation for Structures: Conform to elevations and dimensions shown within a tolerance of plus or minus 0.10', and extending a sufficient distance from footings and foundations to permit placing and removal of concrete formwork, installation of services, other construction, and for inspection.

In excavating for footings and foundations, take care not to disturb bottom of excavation. Excavate by hand to final grade just before concrete reinforcement is placed. Trim bottoms to required lines and grades to leave solid base to receive other work.

Excavation for Pavements: Cut surface under pavements to comply with cross-sections, elevations and grades as shown.

Excavation for Trenches: Dig trenches to the uniform width required for particular item to be installed, sufficiently wide to provide ample working room. Provide 6" to 9" clearance on both sides of pipe or conduit.

Excavate trenches to depth indicated or required. Carry depth of trenches for piping to establish indicated flow lines and invert elevations.

Where rock is encountered, carry excavation 6" below required elevation and backfill with a 6" layer of crushed stone or gravel prior to installation of pipe.

Except as otherwise indicated, excavate for exterior waterbearing piping (water, steam, condensate, drainage) so top of piping is not less than 2'-6" below finished grade.

Grade bottoms of trenches as indicated, notching under pipe bells to provide solid bearing for entire body of pipe.

Backfill trenches with concrete where trench excavations pass within 18" of column or wall footings and which are carried below bottom of such footings, or which pass under wall footings. Place concrete to level of bottom of adjacent footing.

1. Concrete is specified in Division 3.



Do not backfill trenches until tests and inspections have been made and backfilling authorized by Architect/Engineer. Use care in backfilling to avoid damage or displacement of pipe systems.

Excavation for utilities shall conform to manufacturer's recommendations for the type material used.

Cold Weather Protection: Protect excavation bottoms against freezing when atmospheric temperature is less than 35 degrees F.

### COMPACTION:

General: Control soil compaction during construction providing minimum percentage of density specified for each area classification indicated below.

Percentage of Maximum Density Requirements: Compact soil to not less than the following percentages of maximum density for soils which exhibit a well-defined moisture density relationship (cohesive soils) determined in accordance with ASTM D 698; and not less than the following percentages of relative density determined in accordance with ASTM D 2049, for soils which will not exhibit a well-defined moisture-density relationship (cohesionless soils).

1. Structures, Building Slabs and Steps and Pavements: Compact top 6" of subgrade and each layer of backfill (not exceeding 8" maximum) or fill material to not less than 98% of maximum density.
2. Lawn or Unpaved Areas: Compact top 6" of subgrade and each layer or backfill or fill material to not less than 90% of maximum density for cohesive soils and 90% of relative density for cohesionless soils.
3. Walkways: Compact top 6" of subgrade and each layer of backfill or fill material to not less than 95% of maximum density.

Moisture Control: Where subgrade or layer of soil material must be moisture conditioned before compaction, uniformly apply water to surface of subgrade, or layer of soil material, to prevent free water appearing on surface during or subsequent to compaction operations.

Remove and replace, or scarify and air dry, soil material that is too wet to permit compaction to specified density.

1. Soil material that has been removed because it is too wet to permit compaction may be stockpiled or spread and allowed to dry. Assist drying by discing, harrowing or pulverizing until moisture content is reduced to a satisfactory value.

## BACKFILL AND FILL:

General: Place acceptable soil material in layers to required subgrade elevations, for each area classification listed below.

1. Utility Trenches backfill according to manufacturer's recommendation for the type material used.
2. In excavations, use satisfactory excavated or borrow material.
3. Under grassed areas, use satisfactory excavated or borrow material.
4. Under structures, building slabs, steps and pavements and after grading operations, thoroughly mix top 6" of subgrade and compact to a density not less than 98% of maximum density.
5. Under walks and pavements, use satisfactory excavated or borrow material, or combination of both.
6. Under building slabs, use drainage fill material.

Backfill excavations as promptly as work permits, but not until completion of the following:

1. Acceptance of construction below finish grade including, where applicable, dampproofing, waterproofing, and perimeter insulation.
2. Inspection, testing, approval, and recording locations of underground utilities.
3. Removal of concrete formwork.
4. Removal of trash and debris.

Ground Surface Preparation: Remove vegetation, debris, unsatisfactory soil materials, obstructions, and deleterious materials from ground surface prior to placement of fills. Plow, strip, or break-up sloped surfaces steeper than 1 vertical to 4 horizontal so that fill material will bond with existing surface.

When existing ground surface has a density less than that specified under "Compaction" for particular area classification, break up ground surface, pulverize, moisture-condition to optimum moisture content, and compact to required depth and percentage of maximum density.

Placement and Compaction: Place backfill and fill materials in layers not more than 8" in loose depth for material compacted by heavy compaction equipment, and not more than 4" in loose depth for material compacted by hand-operated tampers.

Before compaction, moisten or aerate each layer as necessary to provide optimum moisture content. Compact each layer to required percentage of maximum dry density or relative dry density for each area classification. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.

Place backfill and fill materials evenly adjacent to structures, piping or conduit to required elevations. Take care to prevent wedging action of backfill against structures or displacement of piping or conduit by carrying material uniformly around structure, piping or conduit to approximately same elevation in each lift.

#### GRADING:

General: Uniformly grade areas within limits of grading under this section, including adjacent transition areas. Smooth finished surface within specified tolerances, compact with uniform levels or slopes between points where elevations are indicated, or between such points and existing grades.

Grading Outside Building Lines: Grade areas adjacent to building lines to drain away from structures and to prevent ponding.

Finish surfaces free from irregular surface changes, and as follows:

1. Lawn or Unpaved Areas: Finish areas to receive topsoil to within not more than 0.2' above or below required subgrade elevations.
2. Walks: Shape surface of areas under walks to line, grade and cross-section, with finish surface not more than 0.10' above or below required subgrade elevation.
3. Pavements: Shape surface of areas under pavement to line, grade and cross-section, with finish surface not more than 0.10' above or below required subgrade elevation.

Grading Surface or Fill under Building Slabs: Grade smooth and even, free of voids, compacted as specified, and to required elevation. Provide final grades within a tolerance of 1/2" when tested with a 10' straightedge.

Compaction: After grading, compact subgrade surfaces to the depth and indicated percentage of maximum or relative density for each area classification.

#### BUILDING SLAB DRAINAGE COURSE:

General: Drainage course consists of placement of drainage fill material, in layers of indicated thickness, over subgrade surface to support concrete building slabs.

Placing: Place drainage fill material on prepared subgrade in layers of uniform thickness, conforming to indicated cross-section and thickness. Maintain optimum moisture content for compacting material during placement operations.

When a compacted drainage course is shown to be 6" thick or less, place material in a single layer. When shown to be more than 6" thick, place material in equal layers, except no single layer more than 6" or less than 3" in thickness when compacted.

## FIELD QUALITY CONTROL:

Quality Control Testing During Construction: Allow approved testing laboratory to inspect and approve subgrades and fill layers before further construction work is performed.

1. Perform field density tests in accordance with ASTM D 1556 (sand cone method) or ASTM D 2167 (rubber balloon method), or ASTM D 2922 (nuclear method) as applicable.
2. Footing Subgrade: For each strata of soil on which footings will be placed, conduct at least one test to verify required design bearing capacities. Subsequent verification and approval of each footing subgrade may be based on a visual comparison of each subgrade with related tested strata, when acceptable to Architect/Engineer.
3. Paved Areas and Building Slab Subgrade: Make at least one field density test of subgrade for every 3000 sq. ft. of paved area or building slab, but in no case less than 2 tests. In each compacted fill layer, make one field density test for every 3000 sq. ft. of overlaying building slab or paved area, but in no case less than 2 tests.
4. Foundation Wall Backfill: Take at least 2 field density tests, at locations and elevations as directed.

If in opinion of Architect/Engineer, based on testing service reports and inspection, subgrade or fills which have been placed are below specified density, provide additional compaction and testing at no additional expense.

## MAINTENANCE:

Protection of Graded Areas: Protect newly graded areas from traffic and erosion. Keep free of trash and debris.

Repair and re-establish grades in settled, eroded, and rutted areas to specified tolerances.

Reconditioning Compacted Areas: Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify surface, re-shape, and compact to required density prior to further construction.

Settling: Where settling is measurable or observable at excavated areas during general project warranty period, remove surface (pavement, lawn or other finish), add backfill material, compact, and replace surface treatment. Restore appearance, quality, and condition of surface or finish to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

DISPOSAL OF EXCESS AND WASTE MATERIALS:

Removal from Owner's Property: Remove waste materials, including unacceptable excavated materials, trash and debris, and legally dispose of it off Owner's property site, in area approved by all local authorities and ADEM.

END OF SECTION 02200

## SECTION 02282 - TERMITE CONTROL

### PART 1 – GENERAL

#### RELATED DOCUMENTS

Drawings and general provisions of the contract including General and Supplementary Conditions and Division 1 Specification Sections apply to work of this section.

#### SUMMARY

Provide soil treatment for termite control, as herein specified.

#### SUBMITTALS

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

#### QUALITY ASSURANCE

In addition to requirements of these specifications, comply with manufacturer's instructions and recommendations for work, including preparation of substrate and application.

Engage a professional pest control operator, licensed in accordance with regulations of governing authorities for application of soil treatment solution.

Use only termiticides which bear a Federal registration number of the US Environmental Protection Agency.

#### JOB CONDITIONS

Restrictions: Do not apply soil treatment solution until excavating, filling and grading operations are completed, except as otherwise required in construction operations.

To insure penetration, do not apply soil treatment to frozen or excessively wet soils or during inclement weather. Comply with handling and application instructions of the soil toxicant manufacturer.

#### SPECIFIC PRODUCT WARRANTY

Furnish written warranty certifying that applied soil termiticide treatment will prevent infestation of subterranean termites and that if subterranean termite activity is discovered during warranty period. Contractor will re-treat soil and repair or replace damage caused by termite infestation.

1. Provide warranty for a period of 5 years from date of treatment, signed by Applicator and Contractor.

## PART 2 – PRODUCTS

### SOIL TREATMENT SOLUTION

Use an emulsible concentrate termiticide for dilution with water, specially formulated to prevent infestation by termites. Fuel oil will not be permitted as a diluent. Provide a solution consisting of one of the following chemical elements and concentrations:

1. Water based emulsion, uniform composition, synthetic dye to permit visual identification of treated soil, of a generic chemical type in compliance with state and federal law and regulations.

Solutions as recommended by Applicator and approved for intended application by jurisdictional authorities. Use only soil treatment solutions which are not injurious to planting or persons.

## PART 3 – EXECUTION

### APPLICATION

Surface Preparation: Remove foreign matter which could decrease effectiveness of treatment on areas to be treated. Loosen, rake and level soil to be treated, except previously compacted areas under slabs and foundations. Toxicants may be applied before placement of compacted fill under slabs, if recommended by toxicant manufacturer.

Application Rates: Water to be added to solution at job site in the presence of field Superintendent. Apply soil treatment solution at a rate as recommended by the manufacture at the following locations:

Under slab-on-grade structures, treat soil before concrete slabs are placed, including entire inside perimeter inside of foundation walls, along both sides of interior partition walls, around plumbing pipes and electric conduit penetrating slab and around interior column footers.

Apply chemical solution to soil in critical areas under slab, including entire inside perimeter inside of foundation walls, along both sides of interior partition walls, around plumbing pipes and electric conduit penetrating slab and around interior column footers.

1. Apply chemical solution as an overall treatment under slab and attached slab areas where fill is soil or unwashed gravel. Apply chemical solution to areas where fill is washed gravel or other coarse absorbent material.
2. Apply chemical solution for each foot of depth from grade to footing, along outside edge of building. Dig a trench 6" to 8" wide along outside of foundation to a depth of not less than 12". Punch holes to top of footing at not more than 12" o.c. and apply chemical solution. Mix chemical solution with the soil as it is being replaced in trench.

Under crawl-space and basement structures, treat soil along exterior and interior walls of foundations with shallow footings as specified above for exterior of slab-on-grade structures.

Treat soil under or around crawl-space structures as follows:

1. Apply chemical solution along inside of foundation walls, along both sides of interior partitions, and around piers and plumbing. Do not apply an overall treatment in crawl spaces.
2. Apply chemical solution for each foot of depth from grade to footing, along outside of foundation walls, including part beneath entrance platform porches, etc.
3. Apply chemical solution along the side and outside of foundation walls of porches.
4. Apply as an overall treatment, only where attached concrete platform and porches are on fill or ground.

At hollow masonry foundations or grade beams, treat voids.

At expansion joints, control joints, and areas where slabs will be penetrated, apply chemical solution.

Post signs in areas of application to warn workers that soil termiticide treatment has been applied. Remove signs when areas are covered by other construction.

Reapply soil treatment solution to areas disturbed by subsequent excavation, landscape grading, or other construction activities following application.

END OF SECTION 02282



## SECTION 02513 - ASPHALTIC CONCRETE PAVING

### PART 1 - GENERAL

#### RELATED DOCUMENTS:

Drawings and general provisions of the contract, including General and Supplementary Conditions and Division 1 Specification Sections apply to work of this section.

#### DESCRIPTION OF WORK:

Extent of asphaltic concrete paving work is shown on drawings.

#### QUALITY ASSURANCE:

Referenced Standards: Where the term "Referenced Standard" is used in these Project Specifications, it shall be interpreted as **referring to the current edition of "Standard Specifications for Highway Construction, 2018" or latest edition for Alabama Department of Transportation "**. Referenced Divisions of the "Standard" are hereby made a part of this Project Specification insofar as they may be termed applicable. In no case will requirements for "Method of Measurement" and "Basis of Payment" be considered as applicable to this Project Specification.

#### TESTING AND INSPECTION:

Testing and Inspection Service: The **Owner** will select a firm to provide testing and inspection service, to include testing soil materials proposed for use in work and provide field facilities for quality control testing during paving operations and shall pay cost for testing. Spot checking of the depths of the compacted base prior to paving shall be done to verify that materials meet the minimum required thickness. Temperature and thickness of paving will be periodically monitored during the paving operation.

#### SUBMITTALS:

Material Certificates: Provide copies of materials certificates signed by material producer and Contractor, certifying that each material item complies with, or exceeds, specified requirements.

#### JOB CONDITIONS:

Weather Limitations: Apply prime and tack coats when ambient temperature is above 50 degrees Fahrenheit and when temperature has not been below 35 degrees

Fahrenheit for 12 hours immediately prior to application. Do not apply when base is wet or contains an excess of moisture.

Construct asphalt concrete surface course when atmospheric temperature is above 40 degrees Fahrenheit and when base is dry. Base course may be placed when air temperature is above 30 degrees Fahrenheit and rising.

Grade Control: Establish and maintain required lines and elevations.

## PART 2 - PRODUCTS

MATERIALS: See Civil Drawings and Geotechnical Report for paving sections.

Herbicide Treatment: Commercial chemical for weed control, registered by Environmental Protection Agency. Provide granular, liquid, or wettable powder form.

Manufacturer: Subject to compliance with requirements, provide products of one of the following:

Allied Chemical Corporation  
Achem Products, Inc.  
Ciba-Geigy Corporation  
Dow Chemical U.S.A.  
E.I. DuPont De Nemours and Company, Inc.  
FMC Corporation  
Thompson-Hayward Chemical Company  
U. S. Borax and Chemical Company

## PART 3 - EXECUTION

### SURFACE PREPARATION:

General: The top six inches of finish subgrade soil beneath pavement and base, shall be mixed, moisture adjusted and remolded in accordance with Section 230, Modified Roadbed, of the before mentioned referenced standard.

Proof roll prepared subgrade surface to check for unstable areas and areas requiring additional compaction.

Notify Architect of unsatisfactory conditions. Do not begin paving work until deficient subgrade areas have been corrected and are ready to receive paving.

Herbicide Treatment: Apply chemical weed control agent in strict compliance with manufacturer's recommended dosages and application instructions. Apply to compacted, dry sub grade.

1. Allow to dry until at proper condition to receive paving.

#### PLACING MIX:

General: Place asphalt concrete mixture on prepared surface, spread and strike-off. Spread mixture at minimum temperature of 225 degrees Fahrenheit. Place inaccessible and small areas by hand. Place each course to required grade, cross-section and compact thickness.

Paver Placing: Place in strips not less than 10' wide, unless otherwise acceptable to Architect. After first strip has been placed and rolled, place succeeding strips and extend rolling to overlap previous strips.

Joints: Make joints between old and new pavements, or between successive days' work, to ensure continuous bond between adjoining work. Construct joints to have same texture, density and smoothness as other sections of asphalt concrete course. Clean contact surfaces and apply tack coat.

#### ROLLING:

General: Begin rolling when mixture will bear roller weight without excessive displacement.

Compact mixture with hot hand tampers or vibrating plate compactors in areas inaccessible to rollers.

Breakdown Rolling: Accomplish breakdown or initial rolling immediately following rolling of joints and outside edge. Check surface after breakdown rolling, and repair displaced areas by loosening and filling, if required, with hot material.

Second Rolling: Follow breakdown rolling as soon as possible warm enough for removal of roller marks. Continue rolling until roller marks are eliminated and course has attained maximum density.

Patching: Remove and replace paving areas mixed with foreign materials and defective areas. Cut-out such areas and fill with fresh, hot asphalt concrete. Compact by rolling to maximum surface density and smoothness.

Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.

Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

#### TRAFFIC AND LANE MARKINGS:

Cleaning: Sweep and clean surface to eliminate loose material and dust.

Lane / Parking Marking Paint: Paint Stripes shall be equal to KRYLON INDUSTRIAL LINE-UP PAINT SB Pavement Striping Paint for Parking Lots - Solvent-Based Pavement Striping alkyd paint or equal. Color: White at typical spaces, Blue at handicapped spaces and symbol.

Apply paint with mechanical equipment to produce uniform straight edges. Apply in 2 coats at manufacturer's recommended rates.

#### FIELD QUALITY CONTROL:

General: Test in-place asphalt concrete courses for compliance with requirements for thickness and surface smoothness. Repair or remove and replace unacceptable paving as directed by Architect.

Thickness: In-place compacted thickness will not be acceptable if exceeding 1/4" from required thickness.

Surface Smoothness: Test finished surface of each asphalt concrete course for smoothness, using 10' straight-edge applied parallel with, and at right angles to centerline of paved area. Surfaces will not be acceptable if exceeding the following tolerances for smoothness.

1. Base Course Surface: 1/4".
2. Wearing Course Surface: 3/16"

Check surface areas at intervals as directed by Architect.

#### TESTING:

1. To be performed by independent lab paid by Owner, approved by Architect.
2. Before delivery Bituminous Binder and Wearing Course Materials shall be tested by Lab at Suppliers production plant.
3. Testing shall verify that all samples meet ALDOT specifications.
4. Test reports sent to Architect, Owner, Contractor.

END OF SECTION 02513

## SECTION 02514 - PORTLAND CEMENT CONCRETE PAVING

### PART 1 - GENERAL

#### RELATED DOCUMENTS:

Drawings and general provisions of the contract including General and Supplementary Conditions and Division 1 Specification Sections apply to work of this section.

#### DESCRIPTION OF WORK:

Extent of Portland cement concrete paving work is indicated on drawings.

Paving work includes, but is not limited to the following:

1. Walks, Ramps, Steps, Mechanical Pads, Curb and Gutter.

Prepared subgrade is specified in Specification Section: "EARTHWORK".

Concrete and related materials are specified in Division 3 Specifications.

#### QUALITY ASSURANCE:

Referenced Standards: Where the term "Referenced Standard" is used in these Project Specifications, it shall be interpreted as **referring to the current edition of "Standard Specifications for Highway Construction" 2018 or latest edition of Alabama Department of Transportation**. Referenced Divisions of the "Standard" are hereby made a part of this Project Specification insofar as they may be termed applicable. In no case will requirements for "Method of Measurement" and "Basis of Payment" be considered as applicable to this Project Specification.

#### Testing and Inspection:

1. Testing and Inspection Services: The **Owner** will engage and pay for testing and inspection services, to include testing soil materials proposed for use during paving operations.
2. Field tests will be performed in conjunction with a proof rolling inspection of the prepared subgrade to verify that existing subgrade conditions are similar to those assumed in the design and therefore adequate for support of the pavement system.

Do not change source or brands of material during the course of the work.

## INSPECTION AND APPROVAL OF WORK:

Before commencement of work, Contractor shall coordinate with the Architect to arrange for inspection and approval of initial installation of slabs-on-grade. The approved initial installations shall serve as the standard to which all subsequent work shall adhere.

## PART 2 - PRODUCTS

### PORTLAND CEMENT CONCRETE MATERIALS:

Dumpster Pad: After subgrade is approved, place 6" of 4000 psi concrete (550 psi flexural strength) at the dumpster pad and place 6" of 4000 psi concrete at a 20' approach apron in front of the dumpster pad.

Curbs: shall be constructed to details shown on the drawings with uniform slopes for drainage as indicated, providing for expansion joints at 10' intervals. Form all radii as shown and tool exposed edges of all curbs.

Concrete walks: Concrete walks shall be poured 4" thick with expansion joints every 30 feet **MAXIMUM**; score walks with tool every 6' or **as indicated on drawings**. Light broom finish all walks. Pitch 2% Maximum, 1% Minimum to side for surface drainage. Concrete walks shall be reinforced with 6 x 6 #10/10 mesh unless noted otherwise. Contractor may use fibermesh reinforcement in lieu of wire mesh at walks.

**Provide sawn joints 1/4" wide x 3/4" deep where indicated on drawings.**

**Contractor may also use sawn joints at locations indicated to be scored.**

Pad for Condenser or Transformer: 4" thick concrete slab installed over compacted bed. Edges neatly tooled. Verify exact elevation, size and location with HVAC and/or electrical contractor and architect.

### Materials:

1. Concrete shall be plant or transit mixed having a minimum of 28 day strength of 4000 psi (550 psi flexural strength), maximum 4" slump. Proportioning and control of the mix shall be as required under the concrete section of these specifications.
2. Steel reinforcement if required shall be 6 x 6 #10/10 W.W.M. unless noted otherwise.
3. Expansion joint material shall be premoulded treated fibre 1/2" thick.

### PART 3 – EXECUTION

#### CONCRETE FORMWORK:

Execute construction of concrete formwork in accordance with the "Referenced Standard".

#### CLEANING UP:

Remove all surplus materials, rubble, cartons and other debris resultant from work of this Section and haul off site. Repair damage resulting from paving operations. Leave entire work in broom-clean condition.

END OF SECTION 02514

## SECTION 02660 - WATER DISTRIBUTION SYSTEM

### PART 1 - GENERAL

#### RELATED DOCUMENTS:

Drawings and general provisions of the contract including General and Supplementary Conditions and Division 1 Specification Sections apply to work of this section.

#### SCOPE OF WORK:

The work includes construction of the water distribution system including fire lines as shown on the Drawings.

Testing and disinfection of the installed system shall be incidental to the work.

#### QUALITY ASSURANCE:

Requirements of Regulatory Agencies: Comply with applicable codes, ordinances, rules, regulations, and laws of local, municipal, state or federal authorities having jurisdiction.

Meet all requirements of the Local Water Authority and be subject to review by System inspectors.

#### SITE CONDITIONS:

Coordinate water distribution system with pavement construction.

Install water mains when grade is within 6 in. of final grade.

Coordinate the Work with the Local Water Authority and pay all tap fees assessed (to include valves, backflow preventers, vaults, etc.) for portions of the Work completed by the Utility Provider.

### PART 2 – PRODUCTS

#### MATERIALS:

##### Water Main Piping:

1. Water Service Piping: Ductile iron pipe or PVC pipe.



2. Ductile Iron Pipe:
  - a. Manufactured in accordance with AWWA C-151, latest revision, Class 50, min.
  - b. Standard cement-lined and seal-coated with an approved bituminous seal coat in accordance with AWWA C-104, latest revision.
  - c. Approved push-on, conforming to AWWA C-111, latest revision.

PVC Pipe:

1. Constructed to meet the requirements of U. S. Department of Commerce Product Standard PS 22-70, and bear the National Sanitation Foundation Testing Laboratories, Inc., seal for potable water.
2. For PVC piping less than 4" - Schedule 40, PVC, minimum; 150 psi minimum working pressure
3. 4" or greater shall be C900 PVC piping.

Fire Line:

1. Fire line shall be C900 PVC piping. Encasement shall be used under drive areas.
2. Connection to Main: Each hydrant shall be connected to the main pipe with a 6-inch ductile iron branch. Each hydrant shall be controlled by an independent 6-inch gate valve.

Fire Hydrants:

All hydrants shall be Mueller Company, M & H, or an approved equal. Fire hydrants shall be equipped with traffic break away feature. Hydrants shall be painted in accordance with the requirements of AWWA C502.

Water Main Fittings:

Ductile iron fittings shall be provided in locations as shown on the plans or in locations deemed necessary by the Engineer. Ductile iron fittings 12" and smaller shall be rated for 350 psi working pressure. Fittings shall be manufactured in accordance with AWWA C153 and provided with mechanical joints. All fittings shall be provided with a thin cement lining in accordance with AWWA C104.

PVC Fittings: Fittings For PVC Water Mains Smaller Than 6 In. In. Dia.: As recommended by the manufacturer of the pipe furnished, suitable for use under the conditions specified for the pipe, with ring-tite or fluid-tite bells or spigots at all ends for jointing.

### Valves and Boxes:

Cast Iron Valve Boxes shall be provided for all valves installed vertically and shall consist of a base covering the operating nut and head of the valve, a vertical shaft of at least 5 1/4" in diameter and a top section extending to a point even with the finish ground surface, provided with a cast iron cover marked "WATER." The valve box shall be placed concentrically over the operating nut. Precast concrete collars shall be provided around each valve box.

Valves 2" and Larger: Cast iron gate valves, AWWA type, the standard product of a recognized valve manufacturer such as Mueller, Iowa or M & H, constructed with an interchangeable parts system, with parts readily available, to meet the following requirements:

1. Iron body, bronze-mounted.
2. Double disc, parallel seat "O" ring seal.
3. 150 psi, min., working pressure.
4. Counterclockwise (left) opening.
5. 2 in. operating nut.
6. Non-rising stem.
7. Joints to be as required for pipe to be connected to.

Valves 2" and Smaller: Brass or bronze gate valves, conforming to Federal Specification WW-V-76.

Underground Valves: Two-piece, screw type, adjustable to suit the depth of bury and type of valve, with a min. shaft dia. of 5-1/4 in.

All mechanical joint valves and fittings shall be restrained by MEGALUG series 1100 restraint devices.

## PART 3 – EXECUTION

### INSTALLATION:

General: Line and Grade: Lay and maintain to the required lines and grades; with fittings, valves and hydrants at the required locations; and with joints centered and spigots plumb; and with all valve and hydrant stems plumb.

Encasement: Piping under paved drive shall be encased with welded steel pipe casing.

### Laying Pipe:

General: Before lowering pipe into trenches, grade the bottom of the ditch so that when pipe is in the ditch it will have a bearing for its entire length. Examine the pipe for defects and clean the inside. After placing pipe in ditch, wipe the bell, gasket, and spigot free from all dirt, sand and foreign material. Apply a film of lubricant to the gasket and spigot. Enter the plain end into the socket after which force the pipe into the socket until it makes contact with the bottom of the socket.

A minimum of five (5) feet horizontal separation shall be used when installing water main or piping within areas of sanitary sewer lines. When the proposed water main or piping is required to cross sewer mains, the contractor shall encase the water main carrier pipe with a continuous pipe (sleeve or casing) of sufficient length, located such that a minimum five (5) foot horizontal separation exists between each end of the casing pipe and the sewer main. Where possible, water main shall be a minimum of 18 inches above the top elevation of the sewer main.

No. 12 THW copper locator wire shall be placed in the trench, 12 inches above the water mains and all service piping.

Trench Water: At times when pipe laying is not in progress, close the open ends of pipe by approved means, and permit no trench water to enter the pipe.

Cutting Pipe: Cut pipe for inserting valves, fittings or closure pieces in a neat and workmanlike manner without damage to the pipe.

Direction of Laying: Unless otherwise directed, lay pipe with bell ends facing in the direction of laying. For lines on an appreciable slope, face bells upgrade.

Permissible Deflections: Wherever necessary to deflect pipe from a straight line, either in the vertical or horizontal plane, to avoid obstructing, to plumb stems, or where long radius curves are permitted, deflect as recommended by the manufacturer of the pipe.

Unsuitable Conditions: Lay no pipe in water or when the trench conditions or weather is unsuitable for such work.

Provide ground cover of 3 ft. min.

### Setting Appurtenances:

Valves and Fittings: Set gate valves and pipe fittings to new pipe in the manner previously specified for cleaning, laying and jointing pipe.

Valve Boxes: Firmly support cast iron valve boxes, and maintain centered and plumb over the wrench nut of the gate valve, with box cover flush with the surface of the finished pavement or at such other level as may be directed.

### FIELD QUALITY CONTROL:

Hydrostatic Tests: Pressure During Test: After the pipe has been laid and partially backfilled as specified, pressure test all newly laid pipe, or any valved section of it, in accordance with Local required procedures.

### CLEANING AND DISINFECTION:

Clean out and thoroughly flush the water distribution system piping and leave free from foreign materials of any sort prior to sterilization.

Disinfect in accordance with Local required procedures and AWWA Standard C-651, latest edition.

END OF SECTION 02660

## SECTION 02720 - STORM SEWERS

### PART 1 – GENERAL

#### RELATED DOCUMENTS:

Drawings and general provisions of the contract including General and Supplementary Conditions and Division 1 Specification Sections apply to work of this section.

#### QUALITY ASSURANCE:

Requirements of Regulatory Agencies: Comply with applicable codes, ordinances, rules, regulations, and laws of local, municipal, state or federal authorities having jurisdiction.

All locations including total jobsite: All storm drainage shall be in accordance with Local Requirements.

#### SUBMITTALS:

Submit manufacturer's data, test reports, material certifications as required.

#### SITE CONDITIONS:

Protection of Existing Utilities: Protect existing power lines, water mains, gas lines, telephone lines and other utilities. Should any functioning underground utilities be uncovered during the Work, advise for determination as to whether or not they are to be removed. Repair any damage to utility lines and restore service to original condition.

#### Coordination and Scheduling of Work:

1. Coordinate work with earthwork operations to avoid interference. Protect established construction stakes.
2. Establish and maintain center-lines, grades and elevations.
3. Construction of new sewers and drainage systems shall proceed as early in construction program as possible. Maintain adequate drainage of the project area at all times. Prevent flooding of adjacent roads and private properties.

Temporary Drainage: Wherever possible, construct new sewers and inlets to serve the various drainage areas, and place in service. Where this is not possible, provide temporary drainage facilities as required. These may include temporary connections into completed sewers, or such other means as the circumstances may require.

## PART 2 – PRODUCTS

### MATERIALS:

#### Storm Drain Pipe Materials:

The Contractor shall have the following options for pipe material:

1. Class III reinforced concrete, meeting the requirements of ASTM C76 with tongue and groove joints unless indicated otherwise in the drawings.
2. Contech A-2000
3. ADS N-12 HP

Use ductile iron where indicated on the drawings.

Downspout Shoes: Provide downspout shoes equal to Neenah Foundry Company R-4926-29 Series, inside top bell sized for specified metal downspouts. Connect to metal downspouts and run drain line to storm sewer as indicated on the drawings.

#### Appurtenance Material:

##### Brick:

1. Clay or Shale Brick: Comply with ASTM C 32 for Sewer Brick and Manhole Brick, grade as selected.
2. Concrete Masonry Units: Comply with ASTM C 139.

Mortar: Comply with ASTM C 270, Type M, for pipe joints and man- hole and inlet brickwork.

##### Concrete:

1. Concrete for use in precast concrete catch basins, curb inlets, drop inlets and manholes shall be 3000 psi at age 28 days.

Reinforcement: Comply with ASTM A 615.

Castings: Comply with ASTM A 48, grey cast-iron.

Riprap: Riprap shall be Class I conforming to Section 814 of the State of Alabama Highway Department Standard Specifications.

## PART 3 – EXECUTION

## INSTALLATION:

Storm Drainage System: Construct drainage structures and appurtenances in accordance with applicable standard drawings and construction details shown on the Drawings.

Lay all pipe in an open trench of dimensions as given below:

1. Lengths of storm drain pipe shown on the Drawings are approximate distances center-to-center of structures. Install pipe based on actual field measurements.

## Excavation:

Excavation is open cut. The top portion of trenches may be excavated as required by the Contractor to any width which will not cause damage to adjacent structures. The lower portion of the trench, to a height of 1 ft. above the top of the pipe shall not exceed 18 in. greater than the pipe dia.

All excavation shall be prosecuted in accordance with requirements of OSHA "Safety and Health Regulations for Construction".

When sheeting or shoring is used, widths may be increased by the thickness of the timbers. All protective measures required are the responsibility of the Contractor and shall be provided at the Contractor's expense.

Carefully shape the bottom of trenches to conform to and support the lower 1/4 of the periphery of the pipe barrel. At the Contractor's option, trenches may be excavated slightly over depth, and then the pipe bed may be constructed of approved granular material, thoroughly tamped and carefully shaped to conform to and support the lower 1/4 of the periphery of the pipe barrel. Where rock is encountered, remove to a depth of 6 in. below the pipe and replace with an approved granular material.

Where suitable material, such as muck, is encountered at or below invert elevation during excavation, remove and replace with suitable material, or stabilize by the addition of a granular material.

## Pipe Laying:

Proceed upgrade where practicable. Lay pipe shall true to grade and line with a straight and uniform invert. Do not lay pipe in a wet or muddy trench. Dewater trenches as required with firm, smooth and properly shaped bed as specified.

Lay corrugated metal pipe so that if invert paving has been damaged, repair with an asphaltic compound to the satisfaction of the Engineer.

Joints for reinforced concrete pipe shall be with sand-cement grout.

Backfilling: Backfill with selected material, free from rock larger than 2 in. in size, or debris. Carefully place backfill and tamp around and over the pipe to avoid displacement of the pipe or damage to the joints. Place all backfill in 6 in. lifts and compact as required in EARTHWORK Section. Compaction methods shall be at the Contractor's option as long as the desired results are obtained; otherwise, the Architect may order changes in methods or equipment.

Appurtenances and Drainage Structures:

Furnish and install drainage structures as shown in detail on the Drawings. Install shaped inverts.

Fill all mortar joints full. Tool all joints.

Cut and grind all pipe, where cut at face of structure wall, smooth with the face of the wall.

Pack full all joints around pipe and structure wall at the face of the wall with mortar.

Clean bottom of drainage structures of all debris, and wipe walls clean of mortar as work progresses.

Construct catch basin tops true to line and grade, and slope continuous with gutter.

Install cast iron steps in all structures over 4 ft. deep, installed 15 in. o.c. in a vertical direction. Cast iron steps and manhole rings and covers shall meet ASTM A 48.

Construct junction boxes with bottom as shown in details for drop inlets, catch basins or other structures. Construct tops to accommodate a standard manhole ring, and adjust over to grade.

Where indicated in the Storm Structure Schedule, drainage basins by Contech or Nyloplast may be used.

ADJUSTING AND CLEANING:

At completion, remove all excess materials, debris, etc. resultant from operations of this Section of Work.

Leave drainage systems clean and free from mud or debris of any kind. When looked through, each line between structures shall show a full circle of light; otherwise the Contractor shall be required to remove and replace the defective portion of the work, at the Contractor's expense.

END OF SECTION 02720



## SECTION 02730 - SANITARY SEWERS

### PART 1 - GENERAL

#### RELATED DOCUMENTS:

Drawings and general provisions of the contract including General and Supplementary Conditions and Division 1 Specification Sections apply to work of this section.

#### QUALITY ASSURANCE:

Requirements of Regulatory Agencies: Comply with applicable codes, ordinances, rules, regulations and laws of local, municipal, state or federal authorities having jurisdiction.

Sanitary sewer construction is subject to review and acceptance by the Local Sewer Department and shall meet their requirements.

#### SITE CONDITIONS:

Coordinate sanitary sewer construction with grading operations to avoid deep trench conditions insofar as possible.

### PART 2 – PRODUCTS

#### MATERIALS:

Pipe: Type as shown Drawings.

##### PVC Pipe:

1. Gravity Pipe – Plastic pipe for gravity sewers, stacks and laterals, and fittings shall be unplasticized polyvinyl chloride (PVC), meeting or exceeding ASTM Specification D3034, latest edition, Classification SDR 35.
2. Force Main Pipe – PVC pipe for force mains shall conform to the requirements of ASTM D2241 for pressure pipe or AWWA C900. Pipe shall be Class 150 with a Standard Dimension Ratio of 18 or heavier.
3. All sanitary sewer PVC pipe shall be either green or brown in color.

#### Appurtenances:

1. Manholes: Precast concrete units conforming to ASTM 478.
2. Castings: Grey cast iron conforming to ASTM A 48.

## PART 3 – EXECUTION

### INSTALLATION:

#### Trenching and Excavation:

Excavate in open trench to the width, depth and in the direction necessary for the proper construction of the pipe sewer according to the Drawing.

Shape the bottom of the trench so as to conform as nearly as possible to the outside of the pipe, particular care being taken to recess the bottom of the trench in such a manner as to relieve the bell of the pipe of all load.

Build pipe sewers in a trench, the width of which at the top of the pipe shall not exceed the external dia. of the bell of the pipe, plus 12 in. each side, unless otherwise directed by the Engineer, but in no case less than 24 in. in width.

All excavation shall be performed in accordance with requirements of OSHA "Safety and Health Regulations for Construction".

#### Backfilling:

The sanitary sewer pipe shall be bedded in a crushed stone bench bottom installed to a minimum depth below the pipe of six (6) inches. After the pipe is installed, the trench shall be backfilled with crushed stone to a depth of one-half the pipe diameter for depths of cut of 12 feet or less. For depths of cut greater than 12 feet the pipe shall be backfilled with crushed stone to a height of 6" above the top of the pipe.

No. 12 THW copper locator wire shall be placed in the trench, 12 inches above the sewer mains and all sewer service piping.

Backfill all trenches and excavation immediately after the pipes are laid therein unless other protection for the pipe line is directed. The backfilling material shall be selected and deposited with special reference to the future safety of the pipes. Solidly tamp clean earth, sand or rock dust about the pipe up to the level of 6 in. above the top of the pipe, and carefully deposit in uniform layers, each layer solidly tamped or rammed with proper tools so as not to disturb or injure the pipe line. Mechanical means may be permitted for backfilling, provided the equipment meets the approval of the Architect. Faithfully ram or tamp the remainder of the backfilling of the trenches in layers of not more than 6 in. in depth with either approved mechanical or hand tamps. Compaction shall conform to the requirements of the EARTHWORK Section.

All backfilling material shall be free from rock, trash and debris.

### Laying Pipe

Lay pipe with joints close and even, butting all around, special care being taken that there is no sagging at the hub, and that a true surface is given to the invert throughout the entire length of the sewer.

Water in Trenches: Do not use sewers for draining water from ditch. Provide and operate pumps, if necessary, to remove water from trench while pipe is being laid and joints made.

### Jointing Pipe:

In jointing gasket pipe, clean both the bell and the spigot before the gasket is applied. Use the proper size gasket for each size of pipe, and lubricate only with a lubricant recommended by the manufacturer of the pipe. Insert the spigot end in the bell the proper distance, and take care to see that the pipe remains in this position.

Clean all joint material that may be left on the inside, and leave the pipe clean and smooth throughout. At every third pipe, fill around immediately after being properly placed and jointed to prevent the moving of joints.

Free the interior of the pipe of all dirt and superfluous material of every description, as the work proceeds.

### Manholes:

Manholes shall be precast concrete conforming to ASTM 478. Shape inverts, and build of concrete.

### FIELD QUALITY CONTROL:

Testing: Perform Required Test as required by Local Authority.

### ADJUSTING AND CLEANING:

Clean and clear sanitary sewers of materials of all kind.

END OF SECTION 02730

## SECTION 02810 - SEEDING, SODDING AND TOPSOIL

### RELATED DOCUMENTS:

Drawings and general provisions of the contract including General and Supplementary Conditions and Division 1 Specification Sections apply to work of this section.

### SEEDING:

#### General Requirements:

Sodding shall be restricted to those as instructed or recommended by the local Cooperative Extension Agent except when special instructions to the contrary are issued in writing by the Architect. The Contractor shall furnish, in writing to the Architect, those recommendations of the Extension Agent before proceeding with any seeding operations. Grassing also shall comply with State of Alabama Highway Department Specifications, latest Edition. Contractor shall water and maintain newly grassed areas until acceptable stand of grass is established and approved by the architect.

Preparation of Subgrade Soil - The subgrade soil in those areas to be seeded shown on the plans shall be loosened to a minimum depth of 3 inches and graded to remove all ridges and depressions so that it will be, after settlement everywhere parallel to and at the proper level to provide finished grades specified. All stones over 2" in dimension, sticks, rubbish and other extraneous matter shall be removed during this operation.

Topsoil - Contractor shall furnish and spread layer of topsoil over all areas indicated and topsoil shall be spread in loose layers in those seeded areas shown on the plans to provide finished grades specified and shall have an equal depth of not less than 4" over the site after natural settlement and light rolling.

All lawn areas shall be carefully graded and raked to accurate specified grades and uniform slopes following topsoil spreading. The surface, when finished and settled shall conform to required grades and shall be free from hollows and other inequalities, from stones over 1" in diameter, sticks and other debris, and shall be satisfactory to the Architect.

Initial fertilization of lawn area-prior to sowing of seed and following lawn area preparation, commercial fertilizer 4-10-10 or 4-12-12 shall be applied on all grass areas at the uniform rate of 20 pounds per 1,000 square feet each.

### SODDING

Prepare areas to receive sod as specified. Provide strongly rooted **"#419 Tifton Bermuda"** sod, not less than 2 years old and free of weeds and undesirable native

grasses. Only provide sod capable of growth and development when planted (viable, not dormant). Provide machine cut sod of a uniform minimum soil thickness of 5/8 inch, plus thickness of top growth and thatch. Sod pieces to be consistent in size and shape. **The Contractor shall sod all areas identified on drawings, all graded and disturbed areas, the Contractors staging area and all areas disturbed by vehicular construction traffic.**

#### TOPSOIL

Provide topsoil of natural, friable, fertile, fine loamy, soil possessing the characteristics of representative top- soils in the vicinity which produces a heavy growth; free from subsoil, weeds, litter, clods, stiff clay, stones, stumps, roots, trash, toxic substances or any other material which may be harmful to plant growth or hinder planting operations. The topsoil shall not be in a muddy or frozen condition. Topsoil shall be that material stripped and stockpiled, or as required to provide 4" of coverage over disturbed areas. The topsoil shall have a pH range of 5.9 to 7.0.

There shall be a minimum of 4" of topsoil in the areas to be sodded or seeded under this contract.

Limestone or aluminum sulfate (or acceptable substitute) may be used to adjust the pH of the topsoil to an acceptable level.

END OF SECTION 02810

## SECTION 02846 - SITE GRAPHICS

### PART 1 – GENERAL

#### RELATED DOCUMENTS:

Drawings and general provisions of the contract including General and Supplementary Conditions and Division 1 Specification Sections apply to work of this section.

#### SECTION INCLUDES

Provide traffic control signs complying with U. S. Department of Transportation, Federal Highway Administration's "Manual on Uniform Traffic Control Devices" and as required by other local ordinances or regulations or other governing authorities and as specified herein. See Drawings for type and quantity of signs required.

Work shall comply with the latest edition of city ordinance and/or regulations and requirements of any governing authority on site graphics.

#### SUBMITTALS

Submit manufacturer's mounting instructions to Owner, Architect and Engineer.

### PART 2 – PRODUCTS

Manufacturers: The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:

Signs shall be equivalent to those manufactured by SA-SO, Inc., 1185 - 108th Street, Grand Prairie, Texas.

Equal products of other manufacturers may be used in the work, provide such products have been approved, by the Architect, not less than five (5) days prior to scheduled bid opening.

#### SIGNS

Placement of all site signage shall be as directed by the Architect during construction.

"HANDICAPPED SYMBOL" Signs:

12"x18", blue legend on white reflective or baked enamel background with 12"x6" "Van Accessible" Sign

#### POSTS

Provide 3-1/2" galvanized "U" channel posts (4 lbs./ft.) with sign mounting hardware for each

sign.

#### MOUNTING HARDWARE

Provide stainless steel nuts, bolts, and washers.

#### PART 3 – EXECUTION

##### INSTALLATION

Mount signs in accordance with manufacturer's instructions.

END OF SECTION 02846

## SECTION 03310 - CONCRETE WORK

### PART 1 – GENERAL

#### RELATED DOCUMENTS:

Drawings and general provisions of the contract including General and Supplementary Conditions and Division 1 Specification Sections apply to work of this section.

#### DESCRIPTION OF WORK:

Extent of concrete work is shown on drawings.

#### QUALITY ASSURANCE:

Codes and Standards: Comply with provisions of following codes, specifications and standards, except where more stringent requirements are shown or specified:

1. ACL 301 "Specifications for Structural Concrete for Buildings".
2. ACI 318 "Building Code Requirements for Reinforced Concrete"
3. Concrete Reinforcing Steel Institute, "Manual of Standard Practice".

Concrete Testing Service: The **Owner** will engage and pay a testing laboratory to perform material evaluation tests.

Materials and installed work may require retesting, as directed by Architect, at anytime during progress of work. Provide free access to material stockpiles and facilities. Retesting of rejected materials and installed work, shall be done at Contractor's expense.

#### SUBMITTALS:

Product Data: Submit data for proprietary materials and items, including reinforcement and forming accessories, admixtures, patching compounds, joints systems, curing compounds, dry-shake finish materials and others as requested by Architect.

Shop Drawings Reinforcements: Submit shop drawings for fabrication, bending and placement of concrete reinforcement. Comply with ACI 315 "Manual of Standard Practice for Detailing Reinforced Concrete Structures" showing bar schedules, stirrup spacing, diagrams of bent bars, arrangement of concrete reinforcement.

Material Certificates: Provide materials certificates in lieu of materials laboratory test reports when permitted by Architect. Material certificates shall be signed by manufacturer and Contractor, certifying that each material item complies with, or exceeds, specified requirements.



## FORM MATERIALS:

Forms for Exposed Finish Concrete: Unless otherwise indicated, construct formwork for exposed concrete surfaces with plywood, metal, metal-framed plywood faced or other acceptable panel-type surfaces. Furnish in largest practicable sizes to minimize number of joints and to conform to joint system shown on drawings. Provide form material with sufficient thickness to withstand pressure of newly-placed concrete without bow or deflection.

Use plywood complying with U. S. Product Standard PS-1 "B-B (Concrete Form) Plywood", Class I, Exterior Grade or better, mill-oiled and edge-sealed, with each piece bearing legible inspection trademark.

Forms for Unexposed Finish Concrete: Form concrete surfaces which will be unexposed in finished structure with plywood, lumber, metal, or other acceptable material. Provide lumber dressed on at least two (2) edges and one (1) side for tight fit.

Form Coatings: Provide commercial formulation form-coating compounds that will not bond with, stain nor adversely affect concrete surfaces, and will not impair subsequent treatments of concrete surfaces.

## REINFORCING MATERIALS:

1. Reinforcing Bars: ASTM A 615, Grade 60, deformed, unless otherwise noted.
2. Steel Wire: ASTM A 82, plain, cold-drawn, steel.
3. Welded Wire Fabric: ASTM A 185, welded steel wire fabric.

Supports for Reinforcement: Provide supports for reinforcement including bolsters, chairs, spacers and other devices for spacing, supporting and fastening reinforcing bars and welded wire fabric in place. Use wire bar type supports complying with CRSI specifications, unless otherwise acceptable.

For slabs-on-grade, use supports with sand plates or horizontal runners where base material will not support chair legs.

For exposed to view concrete surfaces, where legs of supports are in contact with forms, provide support with legs which are plastic protected (CRSI, Class I) or stainless steel protected (CRSI, Class 3).

## CONCRETE MATERIALS:

Portland Cement: ASTM C 150, Type 1, unless otherwise acceptable to Architect.

Use one brand of cement throughout project, unless otherwise acceptable to Architect.

Normal Weight Aggregate: ASTM C 33, and as herein specified. Provide aggregate from a single source for all concrete.

Do not use fine or coarse aggregates containing spalling-causing deleterious substances.

Water: Drinkable.

Air-Entraining Admixture: ASTM C 260.

Manufacturers: The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:

"Air-Mix", Euclid Chemical Co.

"Sika-Air", Sika Corp.

"Darex AEA", W. R. Grace

Equal products of other manufacturers may be used in the work, provide such products have been approved, by the Architect, not less than five (5) days prior to scheduled bid opening.

Water-Reducing, Non-Chloride Accelerator Admixture: ASTM C 494, Type E, and containing not more than 0.1% chloride ions.

Manufacturers: The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:

"Accelguard 80"; Euclid Chemical Company

"Pozzolith High Gally"; Master Builders

Equal products of other manufacturers may be used in the work, provide such products have been approved, by the Architect, not less than five (5) days prior to scheduled bid opening.

Water-Reducing, Retarding Admixture: ASTM C 494, Type D, and contain not more than 0.1% chloride ions.

Manufacturers: The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:

"Edoco 20006"; Edoco Technical Products

"Pozzolith 300-R"; Master Builders

"Eucon Retarder 75"; Euclid Chemical Company

"Daratard"; W. R. Grace

"Plastiment"; Sika Chemical Company

Equal products of other manufacturers may be used in the work, provide such products have been approved, by the Architect, not less than five (5) days prior to scheduled bid opening.

Certification: Provide admixture manufacturer's written certification that chloride ion content complies with specified requirements.

Calcium chloride or admixtures containing more than 0.1% chloride ions are not permitted.

#### RELATED MATERIALS:

Moisture Barrier: Provide moisture barrier cover over prepared base material where indicated. Use only materials which are resistant to decay when tested in accordance with ASTM E 154, as follows:

1. Polyethylene sheet not less than 10 mils thick.

Absorptive Cover: Burlap cloth made from jute or kenaf, weighing approximately 9 oz. per sq. yd., complying with AASHTO M 182, Class 2.

Moisture-Retaining Cover: One of the following, complying with ASTM C 171.

1. Waterproof paper
2. Polyethylene film.
3. Polyethylene-coated burlap.

Liquid Membrane Forming Curing Compound: Liquid type membrane forming curing compound complying with ASTM C 309, Type 1-D, Class A unless other type acceptable to Architect. Moisture loss not more than 0.055 gr./sq. cm. when applied at 200 sq. ft./gal. Equal to "Kure-N-Seal" - 30; Sonneborn-Contech

Manufacturers: The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:

Master Builders  
Euclid Chemical Company  
A.C. Horn  
The Burke Company

Equal products of other manufacturers may be used in the work, provide such products have been approved, by the Architect, not less than five (5) days prior to scheduled bid opening.

Bonding Compound: Polyvinyl acetate or acrylic base, re-wettable type.

Manufacturers: The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:

"Welcrete"; Larsen Products  
"EucoWeld"; Euclid Chemical Company  
"Hornweld"; A. C. Horn  
"Sonocrete"; Sonneborn-Contech  
"Acrylic Bondcrete"; The Burke Company

Equal products of other manufacturers may be used in the work, provide such products have been approved, by the Architect, not less than five (5) days prior to scheduled bid opening.

Epoxy Adhesive: ASTM C 881, two component material suitable for use on dry or damp surfaces. Provide material "Type", "Grade", and "Class" to suit project requirements.

Manufacturers: The following manufacturers' products have been used establish minimum standards for materials, workmanship and function:

"Epoxitite"; A. C. Horn  
"Sikadur Hi-Mod"; Sika Chemical Corporation  
"Euco Epoxy 463 or 615"; Euclid Chemical Company  
"Patch and Bond Epoxy"; The Burke Company  
"Sure-Poxy"; Kaufman Products, Inc.

Equal products of other manufacturers may be used in the work, provide such products have been approved, by the Architect, not less than five (5) days prior to scheduled bid opening.

#### PROPORTIONING AND DESIGN OF MIXES:

Prepare design mixes for each type and strength of concrete by either laboratory trial batch or field experience methods as specified in ACI 301. If trial batch method used, use an independent testing facility acceptable to Architect for preparing and reporting proposed mix designs. The testing facility shall not be the same as used for field quality control testing unless otherwise acceptable to Architect.

Submit written reports to Architect of each proposed mix for each class of concrete at least 15 days prior to start of work. Do not begin concrete production until mixes have been reviewed by Architect.

Design mixes to provide normal weight concrete as indicated on drawings and schedules.

Adjustment to Concrete Mixes: Mix design adjustments may be requested by Contractor when characteristics of materials, job conditions, weather, test results, or other circumstances warrant; at no additional cost to Owner and as accepted by Architect. Laboratory test data for revised mix design and strength results must be submitted to and accepted by Architect before using in work.

Admixtures:

Use water-reducing admixture in all concrete for ease of placement and workability.

Use non-chloride accelerating admixture in concrete slabs placed at ambient temperatures below 50 degrees F.

Use air-entraining admixture in all concrete, unless otherwise indicated. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having total air content of 6% with a tolerance of plus-or-minus 1-1/2%.

Slump Limits: Proportion and design mixes to result in concrete slump at point of placement as follows:

1. Ramps, slabs and sloping surfaces: 3" to 5".
2. Reinforced foundation systems: 2" to 5".
3. Other concrete: 3" to 5".

CONCRETE MIXES:

Ready-Mix Concrete: Comply with requirements of ASTM C 94, and as herein specified.

During hot weather, or under conditions contributing to rapid setting of concrete, a shorter mixing time than specified in ASTM C 94 may be required.

When air temperature is between 85 degrees F and 90 degrees, reduce mixing and delivery time from 1-1/2 hours to 75 minutes, and when air temperature is above 90 degrees F, reduce mixing and delivery time to 60 minutes.

FORMS:

Design, erect, support, brace and maintain formwork to support vertical and lateral loads that might be applied until such loads can be supported by concrete structure. Construct formwork so concrete members and structures are of correct size, shape, alignment, elevation and position.

Design formwork to be readily removable without impact, shock or damage to cast-in-place concrete surfaces and adjacent materials.

Construct forms to sizes, shapes, lines and dimensions shown and to obtain accurate alignment, location, grades, level and plumb work in finished structures. Provide for openings, off-sets, sinkages, keyways, recesses, moldings, rustications, reglets, chamfers, blocking, screeds, bulkheads, anchorages and inserts and other features required in work. Use selected materials to obtain required finishes. Solidly butt joints and provide back-up at joints to prevent leakage of cement paste.

Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush plates or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces where slope is too steep to place concrete with bottom forms only. Kerf wood inserts for forming keyways, reglets, recesses and the like, to prevent swelling and for easy removal.

Provide temporary openings where interior area of formwork is inaccessible for cleanout, for inspection before concrete placement, and for placement of concrete. Securely brace temporary openings and set time to forms to prevent loss of concrete mortar. Locate temporary openings on forms at inconspicuous locations.

Chamfer exposed corners and edges as indicated, using wood, metal, PVC or rubber chamfer strips fabricated to produce uniform smooth lines and tight edge joints.

Form Ties: Factory-fabricated, adjustable-length, removable, or snap-off metal form ties, designed to prevent form deflection, and to prevent spalling concrete surfaces upon removal.

Unless otherwise indicated, provide ties so portion remaining within concrete after removal is 1" inside concrete and will not leave holes larger than 1" diameter in concrete surface.

Provisions for Other Trades: Provide openings in concrete formwork to accommodate work of other trades. Determine size and location of openings, recesses and chases from trades providing such items. Accurately place and securely support items built into forms.

Cleaning and Tightening: Thoroughly clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt or other debris just before concrete is placed. Retighten forms and bracing after concrete placement is required to eliminate mortar leaks and maintain proper alignment.

#### PLACING REINFORCEMENT:

Comply with Concrete Reinforcing Steel Institute's recommended practice for "Placing Reinforcing Bars" for details and methods of reinforcement placement and supports, and as herein specified.

Clean reinforcement of loose rust and mill scale, earth, ice and other materials which reduce or destroy bond with concrete.

Accurately position, support and secure reinforcement against displacement by formwork, construction or concrete placement operations. Locate and support reinforcing by metal chairs, runners, bolsters, spacers and hangers as required.

Place reinforcement to obtain at least minimum coverages for concrete protection. Arrange, space and securely tie bars and bar supports to hold reinforcement in position during concrete placement operations. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces.

Install welded wire fabric in as long lengths as practicable. Lap adjoining pieces at least one full mesh and lace splices with wire. Offset end laps in adjacent widths to prevent continuous laps in either direction.

#### JOINTS:

Construction Joints: Locate and install construction joints as indicated, or if not indicated, locate so as not to impair strength and appearance of the structure, as acceptable to Architect.

Place construction joints perpendicular to main reinforcement. Continue reinforcement across construction joints.

Isolation Joints in Slabs-On-Ground: Construct isolation joints in slabs-on-ground at points of contact between slabs on ground and vertical surfaces, such as column pedestals, and elsewhere as indicated.

Joint filler and sealant materials are specified in Division-7 sections of these specifications.

Construction Joints in Slabs-On-Ground: Construct construction joints in slabs-on-ground to form panels of patterns no larger than 600 square feet and as shown and as detailed. An alternative control joint detail may be inserts 1/8" to 1/4" wide x 1/4 of slab depth.

Form contraction joints by inserting premolded plastic, hardboard strip into fresh concrete until top surface of strip is flush with slab surface. Tool slab edges round on each side of insert. After concrete has cured, remove inserts and clean groove of loose debris, fill groove with joint sealant.

Joint sealant material is specified in Division-7 sections of these specifications.

## INSTALLATION OF EMBEDDED ITEMS:

General: Set and build into work anchorage devices and other embedded items required for other work that is attached to, or supported by, cast-in-place concrete. Use setting drawings, diagrams, instructions and directions provided by suppliers of items to be attached thereto.

Edge Forms and Screed Strips for Slabs: Set edge forms or bulkheads and intermediate screed strips for slabs to obtain required elevations and contours in finished slab surface. Provide and secure units sufficiently strong to support types of screed strips by use of strike-off templates or accepted compacting type screeds.

## PREPARATION OF FORM SURFACES:

Clean re-used forms of concrete matrix residue, repair and patch as required to return forms to acceptable surface condition.

Coat contact surfaces of forms with a form-coating compound before reinforcement is placed.

Thin form-coating compounds only with thinning agent of type, and in amount, and under conditions of form-coating compound manufacturer's directions. Do not allow excess form-coating material to accumulate in forms or to come into contact with in-place concrete surfaces against which fresh concrete will be placed. Apply in compliance with manufacturer's instructions.

## CONCRETE PLACEMENT:

Replacement Inspection: Before placing concrete, inspect and complete formwork installation, reinforcing steel, and items to be embedded or cast-in. Notify other crafts to permit installation of their work; cooperate with other trades in setting such work. Moisten wood forms immediately before placing concrete where form coatings are not used.

Coordinate the installation of joint materials and moisture barriers with placement of forms and reinforcing steel.

General: Comply with ACI 304 "Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete", and as herein specified.

Deposit concrete continuously or in layers of such thickness that no concrete will be placed on concrete which has hardened sufficiently to cause the formation of seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as herein specified. Deposit concrete as nearly as practicable to its final location to avoid segregation.



Placing Concrete in Forms: Deposit concrete in forms in horizontal layers not deeper than 24" and in a manner to avoid inclined construction joints. Where placement consists of several layers, place each layer while preceding layer is still plastic to avoid cold joints.

Consolidate placed concrete by mechanical vibrating equipment supplemented by hand-spading, rodding or tamping. Use equipment and procedures for consolidation of concrete in accordance with ACI recommended practices.

Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations not farther than visible effectiveness of machine. Place vibrators to rapidly penetrate placed layer at least 6" into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to set. At each insertion limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing segregation of mix.

Placing Concrete Slabs: Deposit and consolidate concrete slabs in a continuous operation, within limits of construction joints, until the placing of a panel or section is completed.

Consolidate concrete during placing operations so that concrete is thoroughly worked around reinforcement and other embedded items and into corners.

Bring slab surfaces to correct level with straightedge and strike-off. Use bull floats or darbies to smooth surface, free of humps or hollows. Do not disturb slab surfaces prior to beginning finishing operations.

Maintain reinforcing in proper position during concrete placement operations.

Cold Weather Placing: Protect concrete work from physical damage or reduced strength which could be caused by frost, freezing actions, or low temperatures, in compliance with ACI 306 and as herein specified.

When air temperature has fallen to or is expected to fall below 40 degrees F uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 degrees F. and not more than 80 degrees F at point of placement.

Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.

Do not place concrete when air temperature has fallen to or is expected to fall below 35 ° F.

Do not use calcium chloride, salt and other materials containing antifreeze agents or chemical accelerators, unless otherwise accepted in mix designs.

### Hot Weather Placing:

When hot weather conditions exist that would seriously impair quality and strength of concrete, place concrete in compliance with ACE 305 and as herein specified.

Cool ingredients before mixing to maintain concrete temperature at time of placement below 90 degrees F. Mixing water may be chilled, or chopped ice may be used to control temperature provided water equivalent of ice is calculated to total amount of mixing water. Use of liquid nitrogen to cool concrete is Contractor's option.

Cover reinforcing steel with water-soaked burlap if it becomes too hot, so that steel temperature will not exceed the ambient air temperature immediately before embedment in concrete.

Fog spray forms, reinforcing steel and subgrade just before concrete is placed.

Use water-reducing retarding admixture (Type D) when required by high temperatures, low humidity, or other adverse placing conditions.

### FINISH OF FORMED SURFACES:

Rough Form Finish: For formed concrete surfaces not exposed-to-view in the finish work or by other construction, unless otherwise indicated. This is the concrete surface having texture imparted by form facing material used, with tie holes and defective areas repaired and patched and fins and other projections exceeding 1/4" in height rubbed down or chipped off.

Smooth Form Finish: For formed concrete surfaces or that are to be covered with a coating material applied directly to concrete, or a covering material applied directly to concrete such as waterproofing, dampproofing. This is as-cast concrete surface obtained with selected form facing material, arranged orderly and symmetrically with a minimum of seams. Repair and patch defective areas with fins or other projections completely removed and smoothed.

Smooth Rubbed Finish: For formed concrete surfaces exposed to view provide smooth rubbed finish, not later than one day after form removal.

Moisten concrete surfaces and rub with carborundum brick or other abrasive until a uniform color and texture is produced. Do not apply cement grout other than that created by the rubbing process.

Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces occurring adjacent to formed surfaces, strike-off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

## MONOLITHIC SLAB FINISHES:

Finish surfaces to the following tolerances, measured within 24 hours according to ASTM E 1155/E 1155M for randomly trafficked floor surfaces:

1. Specified overall values of flatness, F(F) 38: and levelness, F(L) 25: with minimum local values of flatness, F(F) 19: levelness, F(L) 13: for slabs on grade.

Scratch Finish: Apply scratch finish to monolithic slab surfaces that are to receive concrete floor topping or mortar setting beds for tile, portland cement terrazzo and other bonded applied cementitious finish flooring material, and as otherwise indicated.

Slope surface uniformly to drains where required. After leveling, roughen surfaces before final set, with stiff brushes, brooms or rakes.

Float Finish: Apply float finish to monolithic slab surfaces to receive trowel finish and other finishes as hereinafter specified, and slab surfaces which are to be covered with membrane or elastic waterproofing membrane or elastic roofing, or sand-bend terrazzo, and as otherwise indicated.

After screeding consolidating, and leveling concrete slabs, do not work surface until ready for floating. Begin floating when surface water has disappeared or when concrete has stiffened sufficiently to permit operation of power-driven floats, or both. Consolidate surface with power-driven floats or by hand-floating if area is small or inaccessible to power units. Cut down high spots and fill low spots. Uniformly slope surfaces to drains. Immediately after leveling, refloat surface to a uniform, smooth, granular texture.

Trowel Finish: Apply trowel finish to monolithic slab surfaces to be exposed-to-view and slab surfaces to be covered with resilient flooring, carpet, ceramic or quarry tile, paint or other thin film finish coating system.

After floating, begin first trowel finish operation using a power-driven trowel. Begin final troweling when surface produces a ringing sound as trowel is moved over surface. Consolidate concrete surface by final hand-troweling operation, free of trowel marks, uniform in texture and appearance. Grind smooth surface defects which would telegraph through applied floor covering system.

Non-Slip Broom Finish: Apply non-slip broom finish to exterior concrete platforms, steps and ramps and elsewhere as indicated.

Immediately after trowel finishing, slightly roughen concrete surface by brooming with fiber bristle broom perpendicular to main traffic route. Coordinate required final finish with Architect before application.

## CONCRETE CURING AND PROTECTION:

General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.

Start initial curing as soon as free water has disappeared from concrete surface after placing and finishing. Keep continuously moist for not less than 7 days.

Begin final curing procedures immediately following initial curing and before concrete has dried. Continue final curing for at least seven (7) days in accordance with ACI 301 procedures. Avoid rapid drying at end of final curing period.

Curing Methods: Perform curing of concrete by curing and sealing compound, by moist curing, by moisture-retaining cover curing, and by combinations thereof, as herein specified.

Provide moisture curing by one of the following methods or by a combination of the following methods:

1. Keep concrete surface continuously wet by covering with water.
2. Continuous water-fog spray.
3. Covering concrete surface with specified absorptive cover, thoroughly saturating cover with water and keeping continuously wet. Place absorptive cover to provide coverage of concrete surfaces and edges, with 4" lap over adjacent absorptive covers.

Provide moisture-cover curing as follows:

1. Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width with sides and ends lapped at least 3" and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.

Provide curing and sealing compound to interior slabs with resilient flooring, carpet over cushion, or left exposed; and to exterior slabs, walks, and curbs as follows:

1. Apply specified curing and sealing compound to concrete slabs as soon as final finishing operations are complete (within two hours). Apply uniformly in continuous operation by power-spray or roller in accordance with manufacturer's directions. Recoat areas subjected to heavy rainfall within three (3) hours after initial application. Maintain continuity of coating and repair damage during curing period.

Do not use membrane curing compounds on surface which are to be covered with coating material applied directly to concrete, liquid floor hardener, waterproofing, dampproofing, membrane roofing, flooring (such as ceramic or quarry tile, glue-down carpet), painting and other coatings and finish materials, unless otherwise acceptable to Architect.

Curing Formed Surfaces: Cure formed concrete surfaces, by moist curing with forms in place for full curing period or until forms are removed. If forms are removed, continue curing by methods specified above, as applicable.

Curing Unformed Surfaces: Cure unformed surfaces, such as slabs, floor topping, and other flat surfaces by application of appropriate curing method.

Final cure concrete surfaces to receive liquid floor hardener or finish flooring by use of moisture-retaining cover, unless otherwise directed.

Sealer and Dustproofer: Apply a second coat of specified curing and sealing compound only to surfaces given a first coat.

#### REMOVAL OF FORMS:

Formwork not supporting weight of concrete, such as sides of walls, and similar parts of the work, may be removed after cumulatively curing at not less than 50 degrees F for twenty-four (24) hours after placing concrete, provided concrete is sufficiently hard to not be damaged by form removal operations, and provided cutting and protection operations are maintained.

Formwork supporting weight of concrete, may not be removed in less than fourteen (14) days and until concrete has attained design minimum compressive strength of in place concrete by testing field-cured specimens representative of concrete location in members.

Form facing material may be removed four (4) days after placement, only if shores and other vertical supports have been arranged to permit removal of form facing material without loosening or disturbing shores and supports.

#### RE-USE OF FORMS:

Clean and repair surfaces of forms to be re-used in work. Split, frayed, delaminated or otherwise damaged form facing material will not be acceptable for exposed surfaces. Apply new form coating compound as specified for new formwork.

When forms are extended for successive concrete placement, thoroughly clean surfaces, remove fins and laitance, and tighten forms to close joints. Align and secure joint to avoid offsets. Do not use "patched" forms for exposed concrete surfaces, except as acceptable to Architect.

## MISCELLANEOUS CONCRETE ITEMS:

Filling-In: Fill-in holes and openings left in concrete structures for passage of work by other trades, unless otherwise shown or directed, after work of other trades is in place. Mix, place and cure concrete as herein specified, to blend with in-place construction. Provide other miscellaneous concrete filling shown or required to complete work.

Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and steel-troweling surfaces to a hard, dense finish with corners, intersections and terminations slightly rounded.

Equipment Bases and Foundations: Provide machine and equipment bases and foundations, as shown on drawings. Set anchor bolts for machines and equipment to template at correct elevations, complying with certified diagrams or templates of manufacturer furnishing machines and equipment.

Reinforced Masonry: Provide concrete grout for reinforced masonry, masonry lintels and bond beams where indicated on drawings and as scheduled. Maintain accurate location of reinforcing steel during concrete placement.

## CONCRETE SURFACE REPAIRS:

Patching Defective Areas: Repair and patch defective areas with cement mortar immediately after removal of forms when acceptable to Architect.

Cut out honeycomb, rock pockets, voids over 1/4" in any dimension, and holes left by tie rods and bolts, down to solid concrete but, in no case to a depth of less than 1". Make edges of cuts perpendicular to the concrete surface. Thoroughly clean, dampen with water and brush-coat the area to be patched with specified bonding agent. Place patching mortar after bonding compound has dried.

For exposed to view surfaces, blend white portland cement and standard portland cement so that when dry, patching mortar will match color surrounding. Provide test areas at inconspicuous location to verify mixture and color match before proceeding with patching. Compact mortar in place and strike-off slightly higher than surrounding surface.

Repair of Formed Surfaces: Remove and replace concrete having defective surfaces if defects cannot be repaired to satisfaction of Architect. Surface defects, as such, include color and texture irregularities, cracks, spalls, air bubbles, honeycomb, rock pockets; fins and other projections on surface; and stains and other discolorations that cannot be removed by cleaning. Flush out form tie holes, fill with dry pack mortar, or precast cement cone plugs secured in place with bonding agent.

Repair concealed formed surfaces, where possible, that contain defects that affect the durability of concrete. If defects cannot be repaired, remove and replace concrete.

Repair of Unformed Surfaces: Test unformed surfaces, such as monolithic slabs, for smoothness and verify surface plane to tolerances specified for each surface and finish. Correct low and high areas as herein specified. Test unformed surfaces sloped to drain for trueness of slope, in addition to smoothness using a template having required slope.

Repair finished unformed surfaces that contain defects which affect durability of concrete. Surface defects, as such, include crazing, cracks in excess of 0.01" wide or which penetrate to reinforcement or completely through non-reinforced sections regardless of width, spalling, popouts, honeycomb, rock pockets and other objectionable conditions.

Correct high areas in unformed surfaces by grinding, after concrete has cured at least 14 days.

Correct low areas in unformed surfaces during, or immediately after, completion of surface finishing operations by cutting out low areas and replacing with fresh concrete. Finish repaired areas to blend into adjacent concrete. Proprietary patching compounds may be used when acceptable to Architect.

Repair defective areas, except random cracks and single holes not exceeding 1" diameter, by cutting out and replacing with fresh concrete. Remove defective areas to sound concrete with clean, square cuts and exposed reinforcing steel with at least 3/4" clearance all around.

Dampen concrete surfaces in contact with patching concrete and apply bonding compound. Mix patching concrete of same materials to provide concrete of same type or class as original concrete. Place, compact and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.

Repair isolated random cracks and single holes not over 1" in diameter by dry-pack method. Groove top of cracks and cut-out holes to sound concrete and clean of dust, dirt and loose particles. Dampen cleaned concrete surfaces and apply bonding compound. Mix dry-pack, consisting of one part portland cement to 2-1/2 parts fine aggregate passing a No. 16 mesh sieve, using only enough water as required for handling and placing.

Place dry pack after bonding compound has dried. Compact dry-pack mixture in place and finish to match adjacent concrete. Keep patched area continuously moist for not less than seventy-two (72) hours.

Perform structural repairs with prior approval of Architect for method and procedure, using specified epoxy adhesive and mortar.

Repair methods not specified above may be used, subject to acceptance of Architect.

## QUALITY CONTROL TESTING DURING CONSTRUCTION:

The Owner will employ and pay for a testing laboratory to perform tests and to submit test reports. The Contractor shall notify testing agency 24 hours in advance of requirements.

Sampling and testing for quality control during placement of concrete may include the following, as directed by Architect.

The Owner shall maintain equipment on site to cast cylinders, perform slump and air tests, and field cure specimens. Should the project testing agency be absent from the site, the Contractor will be responsible for performing the field tests below.

Sampling Fresh Concrete: ASTM C 172, except as modified for slump to comply with ASTM C 94.

1. Slump: ASTM C 143; one test at point of discharge for each day's pour of each type of concrete; additional tests when concrete consistency seems to have changed.
2. Concrete Temperature: Test hourly when air temperature is 40 degrees F. and below, and when 80 degrees F. and above; and each time a set of compression test specimens made.
3. Compression Test Specimen: ASTM C 31; one set of four (4) standard cylinders for each compressive strength test, unless otherwise directed. Mold and store cylinders for laboratory cured test specimens except when field-cure test specimens are required.

Compressive Strength Tests: ASTM C 39; one set for each day's pour plus additional sets for each 50 cu. yds. over and above the first 25 cu. yds. of each concrete class placed in any one day; one specimen tested at seven (7) days, two specimen tested at twenty-eight (28) days, and one specimen retained in reserve for later testing if required. Minimum compressive strength of concrete shall be 3,000 psi at 28 days unless otherwise indicated.

When frequency of testing will provide less than five (5) strength tests for a given class of concrete, conduct testing from at least five (5) randomly selected batches or from each batch if fewer than five (5) are used.

When total quantity of a given class of concrete is less than 50 cu. yds., strength test may be waived by Architect if, in his judgment, adequate evidence of satisfactory strength is provided.

When strength of field-cured cylinders is less than 85% of companion laboratory-cured cylinders, evaluate current operations and provide corrective procedures for protecting and curing the in-place concrete.



Test results shall be reported in writing to Architect and Contractor within twenty-four (24) hours that tests are made. Reports of compressive strength tests shall contain the project identification name and number, date of concrete placement, name of concrete testing service, concrete type and class, location of concrete batch in structure, design compressive strength at twenty-eight (28) days, concrete mix proportions and materials; compressive breaking strength and type of break for both 7-day tests and 28-day tests.

Nondestructive Testing: Impact hammer, sonoscope, or other non- destructive device may be permitted but shall not be used as the sole basis for acceptance or rejection.

Additional Tests: The testing service will make additional tests of in-place concrete when test results indicate specified concrete strengths and other characteristics have not been attained in the structure, as directed by Architect. Testing service may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42, or by other methods as directed.

Contractor shall pay for such tests conducted, and any other additional testing as may be required, when unacceptable concrete is verified.

END OF SECTION 03310

## SECTION 04200 - UNIT MASONRY

### PART 1 - GENERAL

#### RELATED DOCUMENTS:

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

#### DESCRIPTION OF WORK:

Extent of each type of masonry work is indicated on drawings and schedule.

Types of masonry work required include.

1. Concrete unit masonry.
2. Brick masonry.
3. Insulation for masonry walls is included in this Section.

#### QUALITY ASSURANCE:

Fire Performance Characteristics: Where indicated, provide materials and construction which are identical to those of assemblies whose fire endurance has been determined by testing in compliance with ASTM E 119 by a recognized testing and inspecting organization or by another means, as acceptable to authority having jurisdiction.

Single Source Responsibility for Masonry Units: Obtain exposed masonry units of uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from one manufacturer for each different product required for each continuous surface or visually related surfaces.

Single Source Responsibility for Mortar Materials: Obtain mortar ingredients of uniform quality, including color for exposed masonry, from one manufacturer for each cementitious component and from one source and producer for each aggregate.

Samples: Submit the following samples:

1. Unit masonry samples for each type of exposed masonry unit required; include in each set the full range of exposed color and texture to be expected in completed work.
2. Include size variation data verifying that actual range of sizes for brick falls within ASTM C652 dimension tolerances for brick where modular dimensioning is indicated. The grade shall be SW and the type HBS.

Field Constructed Mock-Up Panel: Prepare mock-up panel for the following types of masonry. Purpose of mock-up is further verification of selections made for color and finish under sample submittals and establishing standard of quality for aesthetic effects expected in completed work. Build mock-up panel to comply with the following requirements:

1. Locate mock-up panel on site where directed by the Architect.
2. Build mock-up panel of typical exterior masonry wall, approximately 4'-0" long by 4'-0" high, showing all typical components, connections, attachments to building structure and methods of installation.
3. Retain mock-up panel during construction as standard for judging completed masonry work. When directed, demolish mock-up panel and remove from site.

#### DELIVERY, STORAGE AND HANDLING:

Deliver masonry materials to project in undamaged condition.

Store and handle masonry units to prevent their deterioration or damage due to moisture, temperature changes, contaminants, corrosion or other causes. Store masonry units off the ground.

Store cementitious materials off the ground, under cover and in dry location.

Store aggregates where grading and other required characteristics can be maintained.

Store masonry accessories including metal items to prevent deterioration by corrosion and accumulation of dirt.

#### PROJECT CONDITIONS:

Protection of Work: During erection, cover top of walls with waterproof sheeting at end of each day's work. Cover partially completed structures when work is not in progress.

Extend cover a minimum of 24 inches down both sides and hold cover securely in place.

Do not apply uniform floor or roof loading for at least 24 hours after building masonry walls or columns.

Staining: Prevent grout or mortar or soil from staining the face of masonry to be left exposed or painted. Remove immediately grout or mortar in contact with such masonry.

Protect base of walls from rain-splashed mud and mortar splatter by means of coverings spread on ground and over wall surface.

Protect sills, ledges and projections from droppings of mortar.

Environmental Protection:

Maintain air temperature and materials to a minimum of 40 degrees F and a maximum of 90 degrees F prior to and during masonry work

Do not lay masonry units which are wet or frozen.

Remove masonry damaged by freezing conditions.

For clay masonry units with initial rates of absorption (suction) which require them to be wetted before laying, comply with the following requirements.

1. For units with surface temperatures above 32°F wet with water heated to above 70°F.
2. For units with surface temperatures below 32°F wet with water heated to above 130°F.

PART 2 – PRODUCTS

CONCRETE MASONRY UNITS:

General: Comply with referenced standards and other requirements indicated below applicable to each form of concrete masonry unit required.

1. Provide special shapes where required for lintels, corners, jambs, sash, control joints, headers, bonding and other special conditions.
2. Provide bullnose units for outside corners, except where indicated as square-edged.

Concrete Block: Provide units complying with characteristics indicated below for Grade, Type, face size, exposed face and under each form of block included, for weight classification.

1. Grade N
2. Size: Manufacturer's standard units with nominal face dimensions of 16" long x 8" high x thickness indicated.
3. Type I: moisture-controlled units.
4. Exposed Faces: Manufacturer's standard color and texture, unless otherwise indicated.
5. Hollow Loadbearing Block: ASTM C 90 and as follows:
  - a. Weight Classification: Lightweight

## BRICK MADE FROM CLAY OR SHALE:

General: Comply with referenced standards and other requirements indicated below applicable to each form of brick required.

Provide special molded shapes where indicated and for application requiring brick of form, size and finish on exposed surfaces which cannot be produced from standard brick sizes by sawing.

For sills, caps and similar applications resulting in exposure of brick surfaces which otherwise would be concealed from view, provide uncured or unfrogged units with all exposed surfaces finished.

Facing Brick: Submit samples for approval of equals prior to bids. Eased edge brick shall not be allowed.

### Approved Manufacturers:

Jenkins Brick Company, Montgomery, AL

Boral Bricks, Phenix City, AL

Henry Brick Company, Selma, AL

Equal products of other manufacturers may be used in the work provided such products have been approved by the Architect, not less than five (5) days prior to scheduled bid opening.

1. **Field and Accent:**  
**Brick shall have a value of \$500.00 dollars per thousand (Allowances shall be for material only, based on actual number of bricks purchased for the project. Installation, profit, overhead, shipping and taxes shall be included in the Contractors Bid Proposal).** If Architect chooses brick of lesser value after Bid Process, Contractor shall issue a deductive Change Order for the difference.

## MORTAR AND GROUT MATERIALS:

Manufacturers: The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:

"Atlas"

"Citadel"

"Lone Star"

"Magnolia"

Equal products of other manufacturers may be used in the work provided such products have been approved by the Architect, not less than five (5) days prior to scheduled bid opening.

Masonry Cement: ASTM C 91. Type S for CMU walls, Type N for face brick.

1. **Field and Accent:**  
**Exterior Brick:** Type N mortar - color pigment to have a value of \$17.00 dollars per bag. (Allowances shall be for material only, based on actual number of bags purchased for the project. Installation, profit, overhead, shipping and taxes shall be included in the **Contractors Bid Proposal**). If Architect chooses mortar of lesser value after Bid Process, Contractor shall issue a deductive Change Order for the difference.

Hydrated Lime: ASTM C 207, Type S.

Aggregate for Mortar: ASTM C 144, except for joints less than 1/4" use aggregate graded with 100% passing the No. 16 sieve.

Water: Clean and potable.

#### JOINT REINFORCEMENT, TIES AND ANCHORING DEVICES:

Materials: Comply with requirements indicated below for basic materials and with requirements indicated under each form of joint reinforcement, tie and anchor for size and other characteristics.

Use individual galvanized steel metal ties installed in horizontal joints to bond wythes together **only** where wood or metal stud backup occurs. Provide ties as shown, but not less than one metal tie for 4 sq. ft. of wall area spaced not to exceed 24" o.c. horizontally and vertically. Stagger ties in alternate courses. Provide additional ties within 1'-0" of all openings and space not more than 3'-0" apart around perimeter of openings. At intersecting and abutting walls, provide ties at no more than 24" o.c. vertically.

Hot-Dip Galvanized Steel Wire: ASTM A 82 for uncoated wire and with ASTM A 123, Class B-2 (1.5 oz. per sq. ft. of wire surface) for zinc coating applied after prefabrication into units.

Application: Use where indicated.

Joint Reinforcement: Provide truss-type, welded-wire units prefabricated with deformed continuous side rods and plain cross rods into straight lengths of not less than 10', with prefabricated corner and tee units, and complying with requirements indicated below:

1. Width: Fabricate joint reinforcement in units with widths of approximately 2" less than nominal width of walls and partitions as required to provide

mortar coverage of not less than 5/8" on joint faces exposed to exterior and 1/2" else- where.

Manufacturers: The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:

Dur-O-Wall, Inc.  
Heckman Building Products, Inc.  
Masonry Reinforcing Corp. of America.  
National Wire Products Corp.

Equal products of other manufacturers may be used in the work provided such products have been approved by the Architect, not less than five (5) days prior to scheduled bid opening.

### EMBEDDED FLASHING MATERIALS

Metal Flashing: Provide metal flashing, where flashing is exposed or partly exposed and where indicated, complying with SMACNA's "Architectural Sheet Metal Manual" and as follows:

1. Fabricate continuous flashings in sections 96 inches long minimum, but not exceeding 12 feet
2. Provide splice plates at joints of formed, smooth metal flashing.
3. Fabricate through-wall metal flashing embedded in masonry from, with ribs at 3-inch intervals along length of flashing to provide an integral mortar bond.
4. Fabricate through-wall flashing with snaplock receiver on exterior face where indicated to receive counterflashing.
5. Fabricate through-wall flashing with drip edge where indicated. Fabricate by extending flashing 1/2 inch out from wall, with outer edge bent down 30 degrees.
6. Fabricate through-wall flashing with sealant stop unless otherwise indicated. Fabricate by bending metal back on itself 3/4 inch at exterior face of wall and down into joint 3/8 inch to form a stop for retaining sealant backer rod.
7. Fabricate metal drip edges and sealant stops for ribbed metal flashing from plain metal flashing of same metal as ribbed flashing and extending at least 3 inches into wall with hemmed inner edge to receive ribbed flashing and form a hooked seam. Form hem on upper surface of metal so that completed seam will shed water.
8. Metal Drip Edges: Fabricate from stainless steel. Extend at least 3 inches into wall and 1/2 inch out from wall, with outer edge bent down 30 degrees.
9. Metal Flashing Terminations: Fabricate from stainless steel. Extend at least 3 inches into wall and out to exterior face of wall. At exterior face of

wall, bend metal back on itself for 3/4 inch and down into joint 3/8 inch to form a stop for retaining sealant backer rod.

10. Metal Expansion-Joint Strips: Fabricate from stainless steel to shapes indicated.

Flexible Flashing: For flashing not exposed to the exterior, use one of the following, unless otherwise indicated:

1. Elastomeric Thermoplastic Flashing: Composite flashing product consisting of a polyester-reinforced ethylene interpolymer alloy as follows:
  - a. Monolithic Sheet: Elastomeric thermoplastic flashing, 0.040 inch thick.
  - b. Self-Adhesive Sheet: Elastomeric thermoplastic flashing, 0.025 inch thick, with a 0.015-inch thick coating of rubberized-asphalt adhesive.
  - c. Self-Adhesive Sheet with Drip Edge: Elastomeric thermoplastic flashing, 0.025 inch thick, with a 0.015-inch thick coating of rubberized-asphalt adhesive. Where flashing extends to face of masonry, rubberized-asphalt coating is held back approximately 1-1/2 inches from edge.
  - d. Accessories: Provide preformed corners, end dams, other special shapes, and seaming materials produced by flashing manufacturer.
2. EPDM Flashing: Sheet flashing product made from ethylene-propylene-dieneterpolymer, complying with ASTM D 4637, 0.040 inch thick.

Adhesives, Primers, and Seam Tapes for Flashings: Flashing manufacturer's standard products or products recommended by flashing manufacturer for bonding flashing sheets to each other and to substrates.

Manufacturers: The following manufacturers' products have been used to establish minimum standards for materials, workmanship, and function:

Vinyl Sheet Flashing: (Thickness: 20 mils)  
"Vi-Seal Plastic Flashing"; Afco Products, Inc.  
"BFG" Vinyl Water Barrier; B.F. Goodrich Co.  
"Nuflex"; Sandell Manufacturing Co., Inc.  
"Wascoseal"; York Manufacturing, Inc.

Equal products of other manufacturers may be used in the work, provided such products have been approved by the Architect, not less than five (5) days prior to scheduled bid opening.

#### MISCELLANEOUS MASONRY ACCESSORIES:

**See drawings for locations of all required control joints.**



Non-Metallic Expansion Joint Strips: Pre-molded, flexible cellular neoprene rubber filler strips complying with ASTM D 1056, Grade RE41E1, capable of compression up to 35%, of width and thickness indicated.

Premolded Control Joint Strips: Material as indicated below designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.

1. Polyvinyl chloride complying with ASTM D 2287, General Purpose Grade, Designation PVC-63506.

Bond Breaker Strips: Asphalt-saturated organic roofing felt complying with ASTM D 226, Type I (No. 15 asphalt felt).

## INSULATION:

### Cavity Wall Insulation

Manufacturers: The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:

- "Styrofoam SM/SB"; Dow Chemical USA.
- "Foamular 250"; UC Industries.
- "Certifoam", Minnesota Diversified Products, Inc.

Equal products of other manufacturers may be used in the work, provided such products have been approved by the Architect, not less than five (5) days prior to scheduled bid opening.

1. Extruded Polystyrene Board Insulation: Rigid cellular polystyrene thermal insulation with closed cells and integral high density skin, formed by the exposure of polystyrene base resin in an extrusion process to comply with ASTM C 578, Type IV; 5-year aged **R-value of 5.0 Btu/ (hr x sf x degree F) at 75 degree F in manufacturer's standard lengths and widths; 1" thick**, unless otherwise indicated. **Install at the cavity space.**
2. Adhesive: Type recommended by insulation board manufacturer for application indicated.

### CMU Filled Cell Wall Insulation:

Manufacturers: The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:

- "Core-Fill 500", as manufactured by Tailored Chemical Products, Inc., Hickory, NC. Phone: (800) 627-1687: [www.core-fill500.com](http://www.core-fill500.com).

"R501", as manufactured by PolyMaster, Inc.", Knoxville, TN. Phone:  
(800) 580-3626.

"Core Foam Masonry Foam Insulaton" by cfiFOAM, Inc., Knoxville, TN.  
Phone: (800) 656-3626.

Equal products of other manufacturers may be used in the work, provided such products have been approved by the Architect, not less than five (5) days prior to scheduled bid opening.

Filling **masonry cells** with foam insulation from exterior face of Building as follows:

1. Foam Insulation at exterior concrete block wall **cells**: Filling **cells** of concrete masonry with amino-plast foam insulation. Holes for filling cells of masonry shall be drilled at horizontal masonry joint on the exterior side of exposed masonry walls and re-grouted. Installed insulation shall have a **R-10'** value.
2. Reference Standards:
  - a. ASTM C 177 - Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus; 2004.
  - b. ASTM C518 - 01 Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus; 2001.
  - c. ASTM D 1621 - Standard Test Method for Compressive Properties of Rigid Cellular Plastics; 2004a.
  - d. ASTM D 1622 - Standard Test Method for Apparent Density of Rigid Cellular Plastics; 2008.
  - e. ASTM D 2842 - Standard Test Method for Water Absorption of Rigid Cellular Plastics; 2006.
  - f. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2008.
  - g. ASTM E 96/E96M - Standard Test Methods for Water Vapor Transmission of Materials; 2005.
  - h. NFPA 259 - Standard Test Method for Potential Heat of Building Materials
3. Materials:
  - a. Insulation: Aminoplast foam for injection application.
    1. Thermal Resistivity: **R/inch equal to R-4.4/inch @ 75 degrees F mean when tested per either ASTM C-177 or ASTM C518.**
    2. Water Vapor Transmission: Average  $\leq 15$  perms when tested per ASTM E 96/E96M.
    3. Potential Heat:  $\leq 7700$  Btu/lb. when tested per NFPA 259.
    4. Cured Density:  $\leq 1.0$  lb/ft<sup>3</sup> (dry) when tested per ASTM D

1622.

5. Surface Burning Characteristics: Class A - Flame Spread  $\leq 25$ , Smoke Developed  $\leq 450$  per ASTM E 84.

**NOTE: Both Cavity Wall Insulation and CMU Filled Cell Wall Insulation is required at all exterior CMU walls.**

MASONRY CLEANERS:

Job-Mixed Detergent Solution: Solution of trisodium phosphate (1/2 cup dry measure) and laundry detergent (1/2 cup dry measure) dissolved in one gallon of water.

MORTAR AND GROUT MIXES:

General: Do not add admixtures including air-entraining agents, accelerators, retarders, water repellent agents, anti-freeze compounds or other admixtures, unless otherwise indicated.

1. Do not use calcium chloride in mortar or grout.

Mixing: Combine and thoroughly mix cementitious, water and aggregates in a mechanical batch mixer; comply with referenced ASTM standards for mixing time and water content.

Mortar for Unit Masonry: Comply with ASTM C 270, Proportion Specification, for types of mortar required, unless otherwise indicated.

1. For Exterior Brick, use Type N mortar, equal to Flamingo, Blue Circle or Lehigh.
2. For Other Masonry Units use Type S mortar without coloring pigment.

PART 3 – EXECUTION

INSTALLATION, GENERAL:

Wetting Clay Brick: Wet brick made from clay or shale which have ASTM C 67 initial rates of absorption (suction) of more than 30 grams per 30 sq. in. per minute. Use wetting methods which ensure each clay masonry unit being nearly saturated but surface dry when laid.

Do not wet concrete masonry units.

Cleaning Reinforcing: Before placing, remove loose rust, ice and other coatings from reinforcing.

Thickness: Build cavity and composite walls, floors and other masonry construction to

the full thickness shown. Build single wythe walls (if any) to the actual thickness of the masonry units, using units of nominal thickness indicated.

Build chases and recesses as shown or required for the work of other trades. Provide not less than 8" of masonry between chase or recess and jamb of openings, and between adjacent chases and recesses.

Leave openings for equipment to be installed before completion of masonry work. After installation of equipment, complete masonry work to match work immediately adjacent to the opening.

Cut masonry units using motor-given saws to provide clean, sharp, unchipped edges. Cut units as required to provide continuous pattern and to fit adjoining work. Use full-size units without cutting where possible.

1. Use dry cutting saws to cut concrete masonry units.

#### LAYING MASONRY WALLS:

Layout walls in advance for accurate spacing of surface bond patterns with uniform joint widths and to accurately locate openings, movement-type joints, returns and offsets. Avoid the use of less-than-half-size units at corners, jambs and wherever possible at other locations.

Coursing and Bonding: **All CMU shall be Running Bond unless otherwise indicated on structural drawings.**

Stopping and Resuming Work: Rack back 1/2-unit length in each course; do not tooth. Clean exposed surfaces of set masonry, wet units lightly (if required) and remove loose masonry units and mortar prior to laying fresh masonry.

Built-in Work: As the work progresses, build-in items specified under this and other sections of these specifications. Fill in solidly with masonry around built-in items.

1. Fill space between hollow metal frames and masonry solidly with mortar, unless otherwise indicated.

#### MORTAR BEDDING AND JOINTING:

Lay masonry units with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not slush head joints.

Lay hollow concrete masonry units with full mortar coverage on horizontal and vertical face shells. Bed webs in mortar in starting course on footings and in all courses of piers, columns and pilasters, and where adjacent to cells or cavities to be reinforced or filled with concrete or grout. For starting course on footings where cells are not

grouted, spread out full mortar bed including areas under cells.

Maintain joint width shown, except for minor variations required to maintain bond alignment. If not shown, lay walls with 3/8" joints.

Cut joints flush for masonry walls which are to be concealed or to be covered by other materials, unless otherwise indicated.

Tool all exposed joints, except where otherwise indicated, slightly concave using a jointer larger than joint thickness, unless otherwise indicated.

Remove masonry units disturbed after laying; clean and reset in fresh mortar. Do not pound corners or jambs to shift adjacent stretcher units which have been set in position. If adjustments are required, remove units, clean off mortar and reset in fresh mortar.

#### STRUCTURAL BONDING OF MULTI-WYTHE MASONRY:

Use continuous horizontal joint reinforcement installed in horizontal mortar joints for bond tie between wythes. Install at not more than 16" o.c. vertically.

Corners: Provide interlocking masonry unit bond in each course at corners, unless otherwise shown.

1. For horizontally reinforced masonry, provide continuity at corners with prefabricated "L" units, in addition to masonry bonding.

Intersecting and Abutting Walls: Unless vertical expansion or control joints are shown at juncture, provide same type of bonding specified for structural bonding between wythes and space as shown below:

1. At juncture of interior partitions and exterior walls, rake and caulk vertical joint.
2. Provide metal ties as shown below.
3. Provide individual metal ties at not more than 16" o.c. vertically.
4. Provide continuity with horizontal joint reinforcement using prefabricated "T" units.

Intersecting Load-bearing Walls: If carried up separately, block or tooth vertical joint with 8" maximum offsets and provide rigid steel anchors spaced not more than 4'-0" o.c. vertically, or omit blocking and provide rigid steel anchors at not more than 2'-0" o.c. vertically. Form anchors of galvanized steel not less than 1-1/2" x 1/4" x 2'-0" long with ends turned up not less than 2" or with cross-pins. If used with hollow masonry units, embed ends in mortar-filled cores.

Non-bearing Interior Partitions: Build full height of story to underside of roof structure above, unless otherwise shown.

### CAVITY WALLS:

Keep cavity clean of mortar droppings and other materials during construction. Strike joints facing cavity flush.

Tie exterior wythe to new back-up with continuous horizontal joint reinforcing, installed in mortar joints at not more than 16" o.c. vertically.

Provide weep holes (Open Head Joints) in exterior wythe of cavity wall located as directed on the drawings, spaced 32" o.c., unless otherwise indicated.

### CAVITY WALL INSULATION:

On units of plastic insulation, install small pads of adhesive spaced approximately 1'-0" o.c. both ways on inside face. Fit courses of insulation between wall ties and other confining obstructions in cavity, with edges butted tightly both ways. Press units firmly against inside wythe of masonry or other construction as shown.

1. Fill all cracks and open gaps in insulation with crack sealer compatible with insulation and masonry.

### HORIZONTAL JOINT REINFORCEMENT:

General: Provide continuous horizontal joint reinforcement as indicated. Install longitudinal side rods in mortar for their entire length with a minimum cover of 5/8" on exterior side of walls, 1/2" elsewhere. Lap reinforcing a minimum of 6".

Cut or interrupt joint reinforcement at control and expansion joints, unless otherwise indicated.

Reinforce walls with continuous horizontal joint reinforcing unless specifically noted to be omitted.

Reinforce masonry openings greater than 1'-0" wide, with horizontal joint reinforcement placed in 2 horizontal joints approximately 8" apart, immediately above the lintel and immediately below the sill. Extend reinforcement a minimum of 2'-0" beyond jambs of the opening except at control joints.

1. In addition to wall reinforcement, provide additional reinforcement at openings as required to comply with the above.

### CONTROL AND EXPANSION JOINTS:

General: Provide vertical and horizontal expansion, control and isolation joints in masonry where shown. Build-in related items as the masonry work progresses.

## LINTELS:

Install steel lintels where indicated.

Provide masonry lintels where shown and wherever openings of more than 1'-0" for brick size units and 2'-0" for block size units are shown without structural steel or other supporting lintels. Provide formed-in-place masonry lintels. Temporarily support formed-in-place lintels.

Provide minimum bearing of 8" at each jamb, unless otherwise indicated.

## FLASHING OF MASONRY WORK:

General: Provide concealed flashing in masonry work at, or above shelf angles, lintels, ledges and other obstructions to the down-ward flow of water in the wall so as to divert such water to the exterior. Prepare masonry surfaces smooth and free from projections which could puncture flashing. Place through-wall flashing on sloping bed of mortar and cover with mortar. Seal penetrations in flashing with mastic before covering with mortar. Extend flashings through exterior face of masonry and turn down to form drip.

Extend flashing the full length of lintels and shelf angles and minimum of 4" into masonry each end. Extend flashing from exterior face of outer wythe of masonry, through the outer wythe, turned up a minimum of 4", and through the inner wythe to within 1/2" of the interior face of the wall in exposed work. Where interior surface of inner wythe is concealed by furring, carry flashing completely through the inner wythe and turn up approximately 2". At heads and sills turn up ends not less than 2" to form a pan.

Interlock end joints of deformed metal flashings by over-lapping deformations not less than 1-1/2" and seal lap with elastic sealant.

Install flashing to comply with manufacturer's instructions.

Provide weep holes (open head joints) in the head joints of the first course of masonry immediately above concealed flashings. Space weep holes 32" o.c., unless otherwise indicated.

## REPAIR, POINTING AND CLEANING:

Remove and replace masonry units which are loose, chipped, broken, stained or otherwise damaged, or if units do not match adjoining units as intended. Provide new units to match adjoining units and install in fresh mortar or grout, pointed to eliminate evidence of replacement.

Pointing: During the tooling of joints, enlarge any voids or holes, except weep holes, and completely fill with mortar. Point- up all joints including corners, openings and adjacent work to provide a neat, uniform appearance, prepared for application of sealants.

Final Cleaning: After mortar is thoroughly set and cured, clean masonry as follows:

1. Remove large mortar particles by hand with wooden paddles and non-metallic scrape hoes or chisels.
2. Test cleaning methods on sample wall panel; leave 1/2 panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.
3. Protect adjacent non-masonry surfaces from contact with cleaner by covering them with liquid strippable masking agent, polyethylene film or waterproof masking tape.
4. Saturate wall surfaces with water prior to application of cleaners; remove cleaners promptly by rinsing thoroughly with clean water.
5. Use bucket and brush hand cleaning method described in BIA "Technical Note No. 10 Revised" to clean brick masonry made from clay or shale, except use masonry cleaner indicated below.
6. Detergent
7. Clean concrete unit masonry to comply with masonry manufacturer's directions and applicable NCMA "Tek" bulletins.

END OF SECTION 04200



## SECTION 05500 - MISCELLANEOUS STEEL AND METAL FABRICATIONS

### PART 1 – GENERAL

#### RELATED DOCUMENTS:

Drawings and general provisions of the contract including General and Supplementary Conditions and Division 1 Specification Sections apply to work of this section.

#### DESCRIPTION OF WORK:

Definition: Metal fabrications include items made from iron and steel shapes, plates bars, strips, tubes, pipes and castings which are not a part of structural steel or other metal systems specified elsewhere.

Extent of metal fabrications is indicated on drawings and schedules.

Types of work in this section include metal fabrications for:

1. Rough hardware.
2. Nosings.
3. Loose bearing and leveling plates.
4. Loose steel lintels.
5. Miscellaneous framing and supports.
6. Miscellaneous steel trim.
7. Shelf angles.
8. Steel railings.

#### SYSTEM PERFORMANCES:

Structural Performances: Provide assemblies which, when installed, comply with the following minimum requirements for structural performance, unless otherwise indicated.

1. Handrails and Toprails: Capable of withstanding the following loads applied as indicated when tested per ASTM E 935.
2. Concentrated Load: of 200lb applied at any point and any direction.
3. Uniform load of 50 lb per linear ft. applied in any direction.
4. Concentrated and uniform loads above need not be assumed to act concurrently.
5. Guards: Intermediate rails, balusters and panel fillers capable of withstanding a uniform load of 25 lb per sq. ft. of gross area of guard, including any open areas, of which they are a part.

## QUALITY ASSURANCE:

Shop Assembly: Preassemble items in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.

## SUBMITTALS:

Product Data: Submit manufacturer's specifications, anchor details and installation instructions for products used in miscellaneous metal fabrications, including paint products and grout.

Shop Drawings: Submit shop drawings for fabrication and erection of metal fabrications. Include plans, elevations and details of sections and connections. Show anchorage and accessory items. Provide templates for anchor and bolt installation by others.

1. Where materials or fabrications are indicated to comply with certain requirements for design loadings, include structural computations, material properties and other information needed for structural analysis.

Samples: Submit 2 sets of representative samples of materials and finished products as may be requested by Architect.

## PART 2 – PRODUCTS

### MATERIALS:

#### Ferrous Metals:

Metal Surfaces, 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.

Steel Structural, Shapes and Bars: ASTM A 36, wide flange, ASTM A572, fy=50ksi.

Steel Tubing: Hot-rolled, ASTM A 500. FY=46KSI

Structural Steel Sheet: Hot-rolled, ASTM A 570; or cold-rolled ASTM A 611, Class 1; of grade required for design loading.

Galvanized Structural Steel Sheet: ASTM A 446, of grade required for design loading. Coating designation as indicated, or if not indicated, G90.

Steel Pipe: ASTM A 53; Type and grade (if applicable) as selected by fabricator and as required for design loading; black finish unless galvanizing is indicated; standard weight (schedule 40), unless otherwise indicated.

Gray Iron Castings: ASTM A 48, Class 30.

Malleable Iron Castings: ASTM A 47, grade as selected by fabricator.

Brackets, Flanges and Anchors: Cast or formed metal of the same type material and finish as supported rails, unless otherwise indicated.

Concrete Inserts: Threaded or wedge type; galvanized ferrous castings, either malleable iron, ASTM A 47, or cast steel, ASTM A 27. Provide bolts, washers and shims as required, hot-dip galvanized, ASTM A 153.

Non-Shrink Non-Metallic Grout: Pre-mixed, factory-packaged, non-staining, non-corrosive, non-gaseous grout complying with CE CRD-C621. Provide grout specifically recommended by manufacturer for interior and exterior applications of type specified in this section.

#### Fasteners:

General: Provide zinc-coated fasteners for exterior use or where built into exterior walls. Select fasteners for the type, grade and class required.

1. Bolts and Nuts: Regular hexagon head type, ASTM A 307, Grade A.
2. Lag Bolts: Square head type, FS FF-B-561.
3. Machine Screws: Cadmium plated steel, FS FF-S-92.
4. Wood Screws: Flat head carbon steel, FS FF-S-111.
5. Plain Washers: Round, carbon steel, FS FF-W-92.
6. Masonry Anchorage Devices: Expansion shields, FS FF-S-325.
7. Toggle Bolts: Tumble-wing type, FS FF-B-588, type, class and style as required.
8. Lock Washers: Helical spring type carbon steel, FS FF-W-84.

#### Paint:

Shop Primer for Ferrous Metal: Manufacturer's or Fabricator's standard, fast-curing, lead-free, "universal" primer; selected for good resistance to normal atmospheric corrosion, for compatibility with finish paint systems indicated and for capability to provide a sound foundation for field-applied topcoats despite prolonged exposure; complying with performance requirements of FS TT-P-645.

Galvanizing Repair Paint: High zinc dust content paint for regalvanizing welds in galvanized steel, complying with the Military Specifications MIL-P-21035 (Ships) or SSPC-Paint-20.

### Concrete Fill:

Concrete Materials and Properties: Comply with requirements of Division-3 section "Concrete Work" for normal weight, ready-mix concrete with minimum 28-day compressive strength of 3000 psi, and W/C ratio of 0.58 maximum, unless higher strengths indicated.

Non-Slip Aggregate Finish: Factory-graded, packaged material containing fused aluminum oxide grits or crushed emery as abrasive aggregate; rust-proof and non-glazing; unaffected by freezing, moisture or cleaning materials.

### FABRICATION, GENERAL:

Workmanship: Use materials of size and thickness indicated, or if not indicated, as required to produce strength and durability in finished product for use intended. Work to dimensions indicated or accepted on shop drawings, using proven details of fabrication and support. Use type of materials indicated or specified for various components of work.

Form exposed work true to line and level with accurate angles and surfaces and straight sharp edges. Ease exposed edges to a radius of approximately 1/32" unless otherwise indicated. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.

Weld corners and seams continuously, complying with AWS recommendations. At exposed connections, grind exposed welds smooth and flush to match and blend with adjoining surfaces.

Form exposed connections with hairline joints, flush and smooth, using concealed fasteners wherever possible. Use exposed fasteners of type indicated or, if not indicated, Phillips flat-head (countersunk) screws or bolts.

Provide for anchorage of type indicated, coordinated with supporting structure. Fabricate and space anchoring devices to provide adequate support for intended use.

Cut, reinforce, drill and tap miscellaneous metal work as indicated to receive finish hardware and similar items.

Galvanizing: Provide a zinc coating for those items indicated or specified to be galvanized, as follows:

1. ASTM A\_ 153 for galvanizing iron and steel hardware.
2. ASTM A 123 for galvanizing rolled, pressed and forged steel shapes, plates, bars and strip 1/8" thick and heavier.
3. ASTM A\_ 386 for galvanizing assembled steel products.

Fabricate joints which will be exposed to weather in a manner to exclude water or provide weep holes where water may accumulate.

#### Shop Painting:

Apply shop primer to surfaces of metal fabrications except those which are galvanized or as indicated to be embedded in concrete or masonry, unless otherwise indicated, and in compliance with requirements of SSPC-PA1 "Paint Application Specification No. 1" for shop painting.

1. Stripe paint all edges, corners, crevices, bolts, welds and sharp edges.

Surface Preparation: Prepare ferrous metal surfaces to comply with minimum requirements indicated below for SSPC surface preparation specifications and environmental exposure conditions of installed metal fabrications:

1. Exteriors (SSPC Zone 1B): SSPC-SP6 "Commercial Blast cleaning".
2. Interior (SSPC Zone 1A): SSPC-SP3 "Power Tool Cleaning".

#### ROUGH HARDWARE:

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 items are specified in Division-6 sections.

Fabricate items to sizes, shapes and dimensions required. Furnish malleable-iron washers for heads and nuts which bear on wood structural connections; elsewhere, furnish steel washers.

#### LOOSE STEEL LINTELS:

Provide loose structural steel lintels for openings and recesses in masonry walls and partitions as shown and scheduled. Weld adjoining members together to form a single unit where indicated. Provide not less than 8" bearing at each side of openings, unless otherwise indicated. All steel lintels shall be hot-dipped galvanized steel.

#### MISCELLANEOUS FRAMING AND SUPPORTS:

Provide miscellaneous steel framing and supports which are not a part of structural steel framework, as required to complete work.

Fabricate miscellaneous units to sizes, shapes and profiles indicated or, if not indicated, of required dimensions to receive adjacent other work to be retained by framing. Except as otherwise indicated, fabricate from structural steel shapes, plates and steel bars of welded construction using mitered joints for field connection. Cut, drill and tap units to receive hardware and similar items.

Equip units with integrally welded anchors for casting into concrete or building into masonry. Furnish inserts if units must be installed after concrete is placed.

1. Except as otherwise indicated, space anchors 24" o.c. and provide minimum anchor units of 1-1/4" x 1/4" x 8" steel straps.

#### STEEL RAILINGS AND HANDRAILS:

Fabricate steel railings and handrails to design, dimensions, and details indicated. Provide railings and handrails members formed of steel tubing of shapes, sizes and wall thickness indicated, but not less than that required to support design loading.

Interconnect railing and handrail members by butt-welding or welding with internal connectors, at fabricator's option, unless otherwise indicated.

1. At tee and cross intersections provide coped joints.
2. At bends interconnect tubing by means of prefabricated elbow fittings or flush radius bends, as applicable, or radiuses indicated.
3. At elbow bends provide mitered joints.
4. Form bends by use of prefabricated elbow fittings and radius bends or by bending pipe, at fabricator's option.

Form simple and compound curves by bending tubing in jigs to produce uniform curvature for each repetitive configuration required; maintain cylindrical cross-section of pipe throughout entire bend without buckling, twisting or otherwise deforming exposed surfaces of pipe.

Provide wall returns at ends of wall-mounted handrails, except where otherwise indicated.

Close exposed ends of pipe by welding 3/16" thick steel plate in place or by use of prefabricated fittings.

Toe Boards: Where indicated, provide toeboards at railings around openings and at the edge of open-sided floors and platforms. Fabricate to dimensions and details indicated, or if not indicated, use a 4" high x 1/8" plate welded to, and centered between, each railing post.

Brackets, Flanges, Fittings and Anchors: Provide wall brackets, end closures, flanges, miscellaneous fittings and anchors for interconnections of pipe and attachment of railings and handrails to other work. Furnish inserts and other anchorage devices for connecting railings and handrails to concrete or masonry work.

1. For railing posts sets in concrete provide sleeves of galvanized steel pipe not less than 6" long and with an inside diameter not less than 1/2" greater than the outside dimensions of tubing. Provide steel plate closure welded to bottom of sleeve and of width and length not less than 1" greater than outside diameter of sleeve.

Stair Railings and Handrails: Comply with applicable requirements specified elsewhere in this section for steel railings and handrails, and as follows:

1. Railings may be bent at corners, rail returns and wall returns, instead of using prefabricated fittings.
2. Connect railing posts to stair framing by direct welding, unless otherwise indicated.

## PART 3 – EXECUTION

### PREPARATION:

Field Measurements: Take field measurements prior to preparation of shop drawings and fabrication, where possible. Do not delay job progress; allow for trimming and fitting where taking field measurements before fabrication might delay work.

Coordinate and furnish anchorages, setting drawings, diagrams, templates, instructions, and directions for installation of anchorages, such as concrete inserts, sleeves, anchor bolts and miscellaneous items having integral anchors, which are to be embedded in concrete or masonry construction. Coordinate delivery of such items to project site.

### INSTALLATION:

#### General:

Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing miscellaneous metal fabrications to in-place construction; including, threaded fasteners for concrete and masonry inserts, toggle bolts, through-bolts, lag bolts, wood screws and other connectors as required.

Cutting, Fitting and Placement: Perform cutting, drilling and fitting required for installation of miscellaneous metal fabrications. Set work accurately in location, alignment and elevation, plus, level, true and free of rack, measured from established lines and levels. Provide temporary bracing or anchors in formwork for items which are to be built into concrete masonry or similar construction.

Fit exposed connections accurately together to form tight hairline joints. Weld connections which are not to be left as exposed joints, but cannot be shop welded because of shipping size limitations. Grind exposed joints smooth and touch-up shop paint coat. Do not weld, cut or abrade the surfaces of exterior units which have been hot-dip galvanized after fabrication, and are intended for bolted or screwed field connections.

Field Welding: Comply with AWS Code for procedures of manual shielded metal-arc welding, appearance and quality of welds made, and methods used in correcting welding work.

Setting Loose Plates: Clean concrete and masonry bearing surfaces of any bond-reducing materials, and roughen to improve bond to surfaces. Clean bottom surface of bearing plates.

Set loose leveling and bearing plates on wedges, or other adjustable devices. After the bearing members have been positioned and plumbed, tighten the anchor bolts. Do not remove wedges or shims, but if protruding, cut-off flush with the edge of the bearing plate before packing with grout. Use metallic non-shrink grout in concealed locations where not exposed to moisture; use non-metallic non-shrink grout in exposed locations, unless otherwise indicated.

#### Steel Railings and Handrails:

Adjust railing prior to anchoring to ensure matching alignment at abutting joints. Space posts at spacing indicated, or if not indicated, as required by design loadings. Plumb posts in each direction. Secure posts and railing ends to building construction as follows:

1. Anchor posts in concrete by means of sleeves preset and anchored into concrete. After posts have been inserted into sleeves, fill annular space between post and sleeve solid with non-shrink, non-metallic grout, mixed and placed to comply with grout manufacturer's directions.
2. Leave anchorage joint exposed; wipe off excess grout and level 1/8" build-up, sloped away from post. For installation exposed on exterior or to flow of water, seal grout to comply with grout manufacturer's directions.



Secure handrails to wall with wall brackets and end fittings. Provide bracket with not less than 1-1/2" clearance from inside face of handrail and finished wall surface. Locate brackets as indicated, or if not indicated, at spacing required for design loading. Secure wall brackets and wall return fittings to building construction as follows:

1. Use type of bracket with pre-drilled hole for exposed bolt anchorage.
2. For concrete and solid masonry anchorage, use drilled-in expansion shield and either concealed hanger bolt or exposed lag bolt, as applicable.
3. For hollow masonry anchorage, use toggle bolts having square heads.
4. For stud partitions use lag bolts set into wood backing between studs. Coordinate with stud installations for accurate location of backing members.

Expansion Joints: Provide expansion joints at locations indicated, or if not indicated, at intervals not to exceed 40 feet. Provide slip joint with internal sleeve extending 2" beyond joint on either side; fasten internal sleeve securely to one side; locate joint within 6" of posts.

Cast Treads and Thresholds: Install cast treads and thresholds with anchorage system indicated to comply with manufacturer's recommendations. Seal units exposed to exterior mastic to provide a watertight installation.

#### ADJUST AND CLEAN:

Touch-Up Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with same material as used for shop painting.

Apply by brush or spray to provide a minimum dry film thickness of 2.0 mils.

For galvanized surfaces: Clean field welds, bolted connections and abraded areas and apply galvanizing repair paint to comply with ASTM A 780.

END OF SECTION 05500

## SECTION 06100 - ROUGH CARPENTRY

### PART 1 - GENERAL

#### RELATED DOCUMENTS

Drawings and general provisions of the contract, including General and Supplementary Conditions and Division 1 Specification Sections apply to work of this section.

Work Included: All wood, nails, bolts, screws, framing anchors and other rough hardware, and all other items needed for rough and finished carpentry in this work but not specifically described in other sections of these specifications.

Quality Assurance: In addition to complying with all pertinent codes and regulations, all materials of this section shall comply with pertinent provisions of:

Southern Pine	Southern Pine Inspection Bureau
Plywood	"Softwood Plywood - Construction and Industrial" (Amended June 1969), Product Standard PD 1-66 of U.S. Department of Commerce, Bureau of Standards, and A.P.A.
Rough Hardware	"Specification for the Design, Fabrication and Erection of Structural Steel for Buildings of the American Institute of Steel Construction"
Building Paper	Federal Specification UU-B-790a, dated February 5, 1968
Wood Preservative	Standard P-5 of the American Wood Preservers Institute
Other	Similar and pertinent reference standards for the products needed.

Conflicting Requirements: In the event of conflict between pertinent codes and regulations and the requirements of the referenced standards or these specifications, the provisions of the more stringent shall govern.

Qualifications of Workmen: Provide sufficient skilled workmen and supervisors who shall be present at all times during execution of this portion of the work and who shall be thoroughly familiar with the type of construction involved and the materials and techniques specified.

Rejection: In the acceptance or rejection of rough carpentry, no allowance will be made for lack of skill on the part of workmen.

## PRODUCT HANDLING

Protection: Store all materials in such a manner as to ensure proper ventilation and drainage and to protect against damage and the weather.

Use all means necessary to protect lumber materials before, during and after delivery to the job site, and to protect the installed work and materials of all other trades.

Deliver the materials to the job site and store all in a safe area, out of the way of traffic, and shored up off the ground surface.

Protect all metal products with adequate weather-proof outer wrappings.

Use extreme care in the off-loading of lumber to prevent damage, splitting and breaking of materials.

Keep all material clearly identified with all grade marks legible; keep all damaged material clearly identified as damaged, and separately stored to prevent its inadvertent use.

Do not allow installation of damaged or otherwise non-complying material.

Use all means necessary to protect the installed work and materials of all other trades.

Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the Architect and at no additional cost to the Owner.

## PART 2 – MATERIALS

Grade Stamps:

Framing Lumber: Identify all framing lumber by proper grade stamp.

Plywood: Identify all plywood as to species, grade and glue type by the stamp of the American Plywood Association.

Other: Identify all other materials of this section by the appropriate stamp of the agency listed in the reference standards, or by such other means as are approved in advance by the Architect.

**Moisture Content:** Moisture content of any material for framing not to exceed 19% for boards 8" in width or less. Boards exceeding 8" in width not to exceed 15% at time of installation. All material used for finish and trim work to be kiln dried material with moisture content not to exceed that allowed by FHA for intended use.

## MATERIALS

All materials of this Section, unless specifically otherwise approved in advance by the Architect, shall meet or exceed the following:

<u>ITEM:</u>	<u>DESCRIPTION:</u>
Plates, Grounds or furring in contact w/concrete, masonry or plaster	Pressure treated #2 KD Southern Yellow Pine
Plywood Roof Decking	5/8" - 4' x 8' CDX Grade with exterior glue, install with plyclips.
Gypsum Sheathing:	5/8" exterior grade fiberglass faced treated core) gypsum sheathing, equal to Georgia Pacific Dens-Glass Gold with vapor barrier applied.
Plywood Sheathing	1/2" APA plywood sheathing – see structural Drawings
Vapor Barrier	<b>Contractors Option:</b> The General Contractor can furnish and install a TAMKO® TW Moisture Wrap, flexible, 40-mil, self-adhering over all exterior wall sheathing or can elect to seal all joints of the exterior wall sheathing with a spray application of a 10 mil cold fluid applied elastomeric waterproofing equal to Senergy Senersshield R and then an application of a commercial building wrap equal to DuPont "Commercial" wrap over the entire exterior wall sheathing.
All Framing Members	Lodge Pole Spruce #2 KD
Wood Preservative	Ammonical copper arsenite or 5% solution of pentachlorophenol
Steel Hardware	ASTM A-7 or A-36 (Use galvanized at exterior locations)

Machine Bolts	ASTM A-307
Lag Bolts	Federal Specifications FF-B-561
Nails	Common (Except as noted) Federal Specifications FF-N-1-1 (Use galvanized at exterior locations)
Flashing	Nervastral Seal Prof HD-20 except where metal is indicated. Nervastral Seal Prof HD shall be installed on all sills and heads ½" inward from outside face of wall and extended 6" on each side of opening brick veneer construction. The sheeting shall not be allowed to hang free prior to completion of brick work but shall be secured to the siding with nails and discs or furring strips.
Fire Retardant Wood (Decking and Sleepers)	<p><u>PRODUCT IDENTIFICATION</u></p> <p>All lumber and plywood specified to be interior fire retardant treated wood shall be pressure impregnated with Pyro-Guard or equal, which has a flame spread rating of 25 or less when tested in accordance with ASTM E 84, Standard Test Method for Surface Burning Characteristics of Building Materials". Fire retardant treated wood shall show no evidence of significant progressive combustion when the test is extended for an additional 20 minute period. In addition, the flame front shall not progress more than 10½ feet beyond the centerline of the burners at any time during the test.</p> <p>Fire retardant treated lumber and plywood shall be manufactured under the independent third party inspection of Underwriters Laboratories Inc. (UL) Follow-Up Service and each piece shall bear the UL classified mark indicating the extended ASTM E 84 test.</p> <p>Each piece shall be labeled kiln dried after treatment (KDAT). Timber Products Inspection, Inc. (TP) shall monitor the process and the TP mark shall appear on the label.</p>

## FIRE RETARDANT TREATMENT

Manufacturers: The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:

Treatment shall be Pyro-Guard manufactured by Hoover Treated Wood Products, Inc.

Equally acceptable products of other manufacturers may be used in the work, provided such products have been approved by the Architect not less than five (5) days prior to scheduled bid opening.

Structural performance of fire retardant treated wood shall be evaluated in accordance with ASTM D 5664 for lumber and ASTM D 5516 for plywood. Evaluation of plywood data shall be in accordance with ASTM D 6305. The resulting design value and span rating adjustments shall be published in ICC Evaluation Service Report (ESR)-1791 issued by the ICC Evaluation Service, Inc. which includes evaluation of high temperature strength testing for roof applications.

Interior fire retardant treated lumber and plywood shall have equilibrium moisture content of not over 28% when tested in accordance with ASTM D 3201 at 92% relative humidity.

Interior fire retardant treated wood shall be kiln dried after treatment to a maximum moisture content of 19% for lumber and 15% for plywood.

The fire retardant formulation shall be free of halogens, sulfates, chlorides, arsenic, ammonium phosphate, formaldehyde, and urea formaldehyde.

Provide lumber of the appropriate grade and species as specified by the design criteria of the intended application after consideration of design value adjustments.

Provide plywood of the appropriate size, grade and species as specified by the design criteria of the intended application after consideration of span rating adjustments.

### FIELD CUTS

Lumber: Do not rip or mill fire retardant treated lumber. Cross cuts, joining cuts, and drilling holes are permitted.

Plywood: Fire retardant treated plywood may be cut in any direction.

All fire retardant treated lumber and plywood used in structural applications shall be installed in accordance with the conditions and limitations listed in ESR-1791 as issued by the ICC Evaluation Service, Inc.

Treated wood shall not be installed in areas where it is exposed to precipitation, direct wetting, or regular condensation.

Exposure to precipitation during shipping, storage and installation shall be maintained. If material becomes wet, it shall be replaced or permitted to dry to a maximum moisture content of 19% for lumber and 15% for plywood prior to covering or enclosure by wallboard, roofing or other construction materials.

Other Materials: All other materials not specifically described but required for a complete and proper installation as indicated on the drawings, shall be new, suitable for the intended use, and subject to the approval of the Architect.

## PART 3 – EXECUTION

Stockpiling: Stockpile all materials sufficiently in advance of need to ensure their availability in a timely manner for this work.

Delivery Schedules: Make as many trips to the job site as are necessary to deliver all materials of this section in a timely manner to ensure orderly progress of the total work.

Compliance: Do not permit materials not complying with the provisions of this section of these specifications to be brought onto or to be stored at the job site; immediately remove from the job site all non-complying materials and replace them with materials meeting the requirements of this section.

Inspection: Prior to all work of this section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.

Verify that rough carpentry may be performed in strict accordance with the original design and all pertinent codes and regulations.

Discrepancies: In the event of discrepancy, immediately notify the Architect. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.

Workmanship: All rough carpentry shall produce joints true, tight, and well nailed with all members assembled in accordance with the drawings and with all pertinent codes and regulations.

Selection of Lumber Pieces: Carefully select all members; select individual pieces so that knots and obvious defects will not interfere with placing bolts or proper nailing or making proper connections.

Cut out and discard all defects which render a piece unable to serve its intended functions; lumber may be rejected by the Architect, whether or not it has been installed, for excessive warp, twist, bow, crook, mildew, fungus, or mold, as well as for improper cutting and fitting.

Shimming: Do not shim sills, joists, short studs, trimmers, headers, lintels, or other framing components.

Treated Lumber: Use only treated lumber for all wood blocks and nailing grounds, etc. (other than foundation grade redwood) in, or in contact with, concrete.

Treatment: Treat all wood less than two feet above finished grade by spraying with the preservative specified in this section of these specifications, to a minimum distance of six inches from the ends, or otherwise treat as approved in advance by the Architect.



Perform all treatment in strict accordance with published recommendations of the manufacturer of the treatment preservative.

General Framing: In addition to all framing operations normal to the fabrication and erection indicated on the drawings, install all backing required for the work of other trades. Set all horizontal or sloped members with crown up. Do not notch, bore, or cut members for pipes ducts conduits, or other reasons except as shown on the drawings or as specifically approved in advance by the Architect.

Bearing: Make all bearings full unless otherwise indicated on the drawings. Finish all bearing surfaces on which structural members are to rest so as to give sure and even support; where framing members slope, cut or notch the ends as required to give uniform bearing surface.

Blocking: Install all blocking required to support all items of finish and to cut off all concealed draft openings, both vertical and horizontal, between ceiling and floor areas.

All other locations where openings could afford passage for rodents or flames.

Fire-block in the following specific locations:

1. In all stud walls at ceiling and floor levels.
2. In all stud walls, including furred spaces, so that the maximum dimension of each concealed space is not more than eight feet.
3. All other locations where openings could afford passage for rodents or flames.

Stud Walls and Partitions: Make all studs single length, unspliced, and platform framed.

Corners and intersections: Unless otherwise indicated on the drawings, frame all corners and intersections with three or more studs and all required bearing for wall finish.

Alignment: On all framing members to receive a finished wall or ceiling, align the finish subsurface to vary not more than 1/8 inch from the plane of surfaces of adjacent framing and furring members.

Nailing: Use only common wire nails or spikes except where otherwise specifically noted in the drawings.

Provide penetration into the piece receiving the point of not less than 1/2 the length of the nail or spike provided, however, that 16 d nails may be used to connect two pieces of the two inch (nominal) thickness.

Do all nailing without splitting wood, preboring as required; replace all split members.

Bolting: Drill holes 1/16 inch larger in diameter than the bolts being used; drill straight and true from one side only. Bolt threads must not bear on wood; use washers under head and nut where both bear on wood; use washers under all nuts.

Screws: For lag screws and wood screws, prebore holes same diameter as root of thread; enlarge holes to shank diameter for length of shank.

Screw, do not drive, all lag screws and wood screws.

Installation of Building Paper: Install the specified building paper over all exterior framing members where indicated to be installed, lapping all joints to prevent penetration of water into the stud spaces, and securely fastening the paper in place in accordance with the manufacturer's published recommendations.

Cleaning Up: Keep the premises in a neat, safe and orderly condition at all times during execution of this portion of the work, free from accumulation of sawdust, cut-ends, and debris.

END OF SECTION 06100

## SECTION 06192 – METAL PLATE CONNECTED WOOD TRUSSES

### PART 1 - GENERAL

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

### SUMMARY

This Section includes the following:

1. Roof trusses.
2. Truss accessories.

Related Sections: The following Sections contain requirements that relate to this Section:

1. Division 5 Section "Metal Fabrications" for rough hardware anchoring trusses to concrete or masonry structures.
2. Division 6 Section "Rough Carpentry" for roof and floor sheathing of structural-use panels and dimension lumber for supplementary framing and permanent bracing.

### DEFINITIONS

Metal-plate-connected wood trusses include planar structural units consisting of metal-plate-connected members fabricated from dimension lumber and cut and assembled before delivery to Project site.

### PERFORMANCE REQUIREMENTS

Structural Performance: Engineer, fabricate, and erect metal-plate-connected wood trusses to withstand design loads within limits and under conditions required.

1. Design Loads: As indicated.
2. The truss manufacture shall design the trusses for the sprinkler piping load and to provide adequate support at the connection points.

Engineering Responsibility: Engage a fabricator who uses a qualified professional engineer to prepare calculations, Shop Drawings, and other structural data for metal-plate-connected wood trusses.

## SUBMITTALS

General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.

Product Data for lumber, metal-plate connectors, metal framing connectors, bolts, and fasteners.

Shop Drawings detailing location, pitch, span, camber, configuration, and spacing for each type of truss required; species, sizes, and stress grades of lumber to be used; splice details; type, size, material, finish, design values, and orientation and location of metal connector plates; and bearing details.

1. To the extent truss design considerations are indicated as fabricator's responsibility, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
2. Include truss Shop Drawings signed and sealed by the qualified professional engineer responsible for their preparation.

Product certificates signed by officer of truss fabricating firm certifying that metal-plate-connected wood trusses supplied for Project comply with specified requirements and Shop Drawings.

Qualification data for firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

Material test reports from a qualified independent testing agency indicating and interpreting test results relative to compliance of fire-retardant-treated wood products with requirements indicated.

Material certificates for dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the American Lumber Standards Committee (ALSC) Board of Review.

## QUALITY ASSURANCE

Installer Qualifications: Engage an experienced Installer who has completed wood truss installation similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance.

Fabricator's Qualifications: Engage a firm that complies with the following requirements for quality control and is experienced in fabricating metal-plate-connected wood trusses similar to those indicated for this Project and with a record of successful in-service performance:

Fabricator participates in a recognized quality-assurance program that involves inspection by SPIB; Timber Products Inspection, Inc.; Truss Plate Institute (TPI); or other independent inspecting and testing agency acceptable to Architect and authorities having jurisdiction.

Comply with applicable requirements and recommendations of the following publications:

1. ANSI/TP1 1, "National Design Standard for Metal-Plate-Connected Wood Truss Construction."
2. TPI HIB "Commentary and Recommendations for Handling Installing & Bracing Metal Plate Connected Wood Trusses."
3. TPI DSB "Recommended Design Specification for Temporary Bracing of Metal Plate Connected Wood Trusses."

Metal-Plate Connector Manufacturer's Qualifications: A manufacturer that is a member of TPI and that complies with TPI quality-control procedures for manufacture of connector plates published in ANSI/TPI 1.

Single-Source Responsibility for Connector Plates: Provide metal connector plates from one source and by a single manufacturer.

Wood Structural Design Standard: Comply with applicable requirements of AFPA's "National Design Specification for Wood Construction" and its "Supplement."

Single-Source Engineering Responsibility: Provide trusses engineered by metal-plate connector manufacturer to support superimposed dead and live loads indicated, with design approved and certified by a qualified professional engineer.

Professional Engineer Qualifications: A professional engineer who is legally authorized to practice in the jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated that have resulted in installing metal-plate-connected wood trusses similar to those indicated for this Project and with a record of successful in-service performance.

NOTE: AT THE COMPLETION OF TRUSS ERECTION THE CONTRACTOR SHALL PROVIDE A TRUSS INSPECTION OF THE INSTALLED TRUSSES AND PERMANENT BRACING BY AN ENGINEER REGISTERED IN THE STATE OF ALABAMA. THE ENGINEER'S REPORT SHALL CERTIFY THE TRUSSES ARE CORRECTLY INSTALLED, USING SPECIFIED WOOD GRADE, AND CONFIGURED TO MEET THE DESIGN OF THE SUPPLIER. HIS SIGNED SEAL SHALL BE AFFIXED TO THE REPORT AND SUBMITTED TO THE ARCHITECT AND ENGINEER OF RECORD.

### DELIVERY, STORAGE, AND HANDLING

Handle and store trusses with care and comply with manufacturer's written instructions and TPI recommendations to avoid damage and lateral bending.

Inspect trusses showing discoloration, corrosion, or other evidence of deterioration. Discard and replace trusses that are damaged or defective.

### SEQUENCING AND SCHEDULING

Time delivery and erection of trusses to avoid extended on-site storage and to avoid delaying progress of other trades whose work must follow erection of trusses.

## PART 2 - PRODUCTS

### MANUFACTURERS

Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Metal Connector Plates:
  - a. Alpine Engineered Products, Inc.
  - b. Computrus, Inc.
  - c. Mitek Industries, Inc.
  - d. Robbins Manufacturing Company.
  - e. Tee-Lok Corporation.
  - f. Truswal Systems Corporation.
2. Metal Framing Anchors:
  - a. Cleveland Steel Specialty Co.
  - b. Harlen Metal Products, Inc.
  - c. Silver Metal Products, Inc.
  - d. Simpson Strong-Tie Company, Inc.
  - e. Southeastern Metals Manufacturing Co., Inc.
  - f. United Steel Products Co.

## DIMENSION LUMBER

Lumber Standards: Comply with DOC PS 20, "American Softwood Lumber Standard," and with applicable grading rules of inspection agencies certified by ALSC's Board of Review.

Inspection Agencies: Inspection agencies, and the abbreviations used to reference them, include the following:

1. SPIB - Southern Pine Inspection Bureau.

Grade Stamps: Provide lumber with each piece factory marked with grade stamp of inspection agency evidencing compliance with grading rule requirements and identifying grading agency, grade, species, moisture content at time of surfacing, and mill. Provide dressed lumber, S4S, manufactured to actual sizes required by DOC PS 20 for moisture content specified, to comply with requirements indicated below:

1. Provide dry lumber with 19 percent maximum moisture content at time of dressing.

Grade and Species: Provide visually graded dimension lumber for truss chord and web members, of the following grade and species:

1. Grade for Chord Members: No. 2.
2. Grade for Web Members: No. 2.
3. Species: Southern pine graded per SPIB rules.

## METAL CONNECTOR PLATES

General: Fabricate connector plates from metal complying with requirements indicated below.

Hot-Dip Galvanized Steel Sheet: Structural-quality steel sheet, zinc coated by hot-dip process complying with ASTM A 653, G60 coating designation; Grade 33 and not less than 0.0359 inch thick.

Electrolytic Zinc-Coated Steel Sheet: ASTM A 591, structural-(physical) quality steel sheet, zinc coated by electrodeposition; 33,000-psi minimum yield strength, coating class C, and not less than 0.0474 inch thick.

## FASTENERS

General: Provide fasteners of size and type indicated that comply with requirements specified below for material and manufacture.

1. Where truss members are exposed to weather or to high relative humidities, provide fasteners with a hot-dip zinc coating per ASTM A 153 or of stainless steel, Type 304 or 316.

Nails, Wire, Brads and Staples: FS FF-N-105.

Power-Driven Fasteners: CABO NER-272.

Wood Screws: ASME B18.6.1.

Lag Bolts and Screws: ASME B18.2.1.

Bolts: Steel bolts complying with ASTM A 307, Grade A; with ASTM A 563 hex nuts and, where indicated, flat washers.

## METAL FRAMING ANCHORS

General: Provide metal framing anchors of structural capacity, type, size, metal, and finish indicated that comply with requirements specified, including the following:

Research or Evaluation Reports: Provide products for which model code research or evaluation reports exist that are acceptable to authorities having jurisdiction and that evidence compliance of metal framing anchors for application indicated with building code in effect for this Project.

1. Allowable Design Loads: Provide products with allowable design loads, as published by manufacturer that meet or exceed those indicated. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis, and demonstrated by comprehensive testing performed by a qualified independent testing agency.

Galvanized Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A 653, G60 coating designation; structural, commercial, or lock-forming quality, as standard with manufacturer for type of anchor indicated.

Stainless-Steel Sheet: ASTM A 666, Type 304 or 316, chromium nickel steel sheet; 33,000-psi minimum yield strength.



## MISCELLANEOUS MATERIALS

Galvanizing Repair Paint: SSPC-Paint 20 or DOD-P-21035, with dry film containing a minimum of 94 percent zinc dust by weight.

## FABRICATION

Cut truss members to accurate lengths, angles, and sizes to produce close-fitting joints.

Fabricate metal connector plates to size, configuration, thickness, and anchorage details required to withstand design loadings for types of joint designs indicated.

Assemble truss members in design configuration indicated using jigs or other means to ensure uniformity and accuracy of assembly with joints closely fitted to comply with tolerances of ANSI/TPI 1. Position members to produce design camber indicated.

1. Fabricate wood trusses within manufacturing tolerances of ANSI/TPI 1.

Connect truss members by metal connector plates located and securely embedded simultaneously into both sides of wood members by air or hydraulic press.

## PART 3 - EXECUTION

### INSTALLATION

Do not install wood trusses until supporting construction is in place and is braced and secured.

Before installing, splice trusses delivered to Project site in more than one piece.

Hoist trusses in place by lifting equipment suited to sizes and types of trusses required, exercising care not to damage truss members or joints by out-of-plane bending or other causes.

Install and brace trusses according to recommendations of TPI and as indicated.

Install trusses plumb, square, and true to line and securely fasten to supporting construction.

Space, adjust, and align trusses in location before permanently fastening and as follows:

1. Truss Spacing: As indicated.

Anchor trusses securely at all bearing points using metal framing anchors. Install fasteners through each fastener hole in metal framing anchor according to manufacturer's fastening schedules and written instructions.

Securely connect each truss ply required for forming built-up girder trusses.

1. Anchor trusses to girder trusses as indicated.

Install and fasten permanent bracing during truss erection and before construction loads are applied. Anchor ends of permanent bracing where terminating at walls or beams.

1. Install and fasten strongback bracing vertically against vertical web of parallel-chord floor trusses at centers indicated.

Install wood trusses within installation tolerances of ANSI/TPI 1.

Do not cut or remove truss members.

Return wood trusses that are damaged or do not meet requirements to fabricator and replace with trusses that do meet requirements.

1. Do not alter trusses in the field.

#### REPAIRS AND PROTECTION

Repair damaged galvanized coatings on exposed surfaces with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.

END OF SECTION 06192

## SECTION 06241 – SOLID SURFACE WINDOW SILLS

### PART I - GENERAL

#### RELATED DOCUMENTS:

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

#### DESCRIPTION OF WORK:

Types of Work Include: Solid Surface window sills, trim, adhesives and sealants

#### SUBMITTALS:

Furnish 5 copies of shop drawings indicating all sizes, details, layout, etc. for approval.

Furnish 1 complete set of all color and texture samples for selection.

Maintenance Data: Submit manufacturer's published maintenance manual with closeout submittals

Standards: Comply with requirements of Architectural Woodwork Institute.

#### DELIVERY AND STORAGE:

Deliver, store and handle counter tops in manner to prevent damage and deterioration.

Defer delivery to the job until the installation and storage areas are complete and dry of all wet-type construction.

Maintain relative humidity in storage areas not to exceed 60 percent.

Protect all surfaces of window sill tops subject to damage while in transit.

### PART 2 - PRODUCTS

#### MATERIALS:

Solid Surface Window Sills:

General: Except as otherwise indicated, provide solid surface window sills installed on support system as indicated.

Material Composition: Acrylic resins, fire-retardant mineral fillers, and proprietary coloring agents. Through-the-body color for full thickness of sheet material. As manufactured by one of the following:

Corian, Wilsonart, Swanstone or Formica.

Material Thickness: 1/2 inch, nominal.

Edge Detail: Indicated on Drawings, otherwise as selected from manufacturer's standard offerings

### ACCESSORY MATERIALS

Joint Adhesive: Methacrylate-based adhesive for chemically bonding solid surfacing seams. Color complementary to solid surfacing sheet material. UL 2818 GREENGUARD Gold certified and complies with SCAQMD Rule 1168. 1. Product: "Wilsonart Hard Surface Adhesive."

Elastomeric Sealant: Mildew-resistant silicone sealant for filling gaps between countertops and terminating substrates in wet environment applications. Complies with ASTM C 920, Type S (single component), Grade NS (nonsag).

1. Product: Acceptable to countertop manufacturer.
2. Color: Selected from sealant manufacturer's standard offerings].

Siliconized Acrylic Sealant: Siliconized acrylic latex sealant. For general applications to fill gaps between countertops and at terminating substrates. Complies with ASTM C 834, Type OP, Grade NF, and SCAQMD Rule 1168.

1. Product: Manufacturer Color Matched Caulk.
2. Color: Selected from sealant manufacturer's standard offerings.

Construction Adhesive: Countertop manufacturer's recommended silicone-based construction adhesive for backsplashes, endsplashes, and other applications according to manufacturer's published fabrication instructions.

### FABRICATION

Fabricate components in shop, to greatest extent practicable, in sizes and shapes indicated according to approved shop drawings and Wilsonart published fabrication requirements.

Form joint seams between solid surfacing components with specified seam adhesive. Completed joints inconspicuous in appearance and without voids. Provide joint reinforced if required by manufacturer for particular installation conditions.

Provide holes and cutouts indicated on approved shop drawings. Rout cutouts and complete by sanding all edges smooth.

### PART 3 - EXECUTION

#### EXAMINATION

Examine substrates and conditions that could adversely affect the work of this Section.

Substrates must be sound, flat, smooth, and free from dust or other surface contaminants.

Commencement of work will constitute acceptance of substrates and conditions to receive the work.

#### WINDOW SILL INSTALLATION

Install window sills for full length of each window unit, securing to substrates with concealed fasteners and specified adhesive.

Provide minimum 1/8 inch expansion gap on both sides of window sills. Fill gap with specified joint sealant.

Completed work to be plumb, level, and true, with edges eased and sanded smooth.

#### REPAIRS

If permissible to Architect, minor surface marring for solid surfacing components may be repaired according to manufacturer's published installation instructions.

Remove and replace solid surfacing components that are damaged and cannot be satisfactorily repaired.

#### CLEANING AND PROTECTION

Clean solid surfacing components according to manufacturer's published maintenance instructions. Completely remove excess adhesives and sealants from finished surfaces.

Protect completed work from damage during remainder of construction period.

END OF SECTION 06241

## SECTION 07115 – BITUMINOUS DAMPPROOFING

### PART 1 – GENERAL

#### RELATED DOCUMENTS:

Drawings and general provisions of the contract including General and Supplementary Conditions and Division 1 Specification Sections apply to work of this section.

#### SUMMARY

This Section includes cold-applied, emulsified-asphalt dampproofing applied to the following surfaces:

Exterior face of inner wythe of exterior masonry cavity walls.

#### SUBMITTALS

Product Data: For each type of product indicated. Include recommendations for method of application, primer, number of coats, coverage or thickness, and protection course.

Material Certificates: For each product, signed by manufacturers.

#### QUALITY ASSURANCE

Source Limitations: Obtain primary dampproofing materials and primers through one source from a single manufacturer. Provide secondary materials recommended by manufacturer of primary materials.

#### PROJECT CONDITIONS

Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit asphalt dampproofing to be performed according to manufacturers' written instructions.

### PART 2 – PRODUCTS

Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

Cold-Applied, Emulsified-Asphalt Dampproofing:  
Euclid Chemical Company (The)  
Gardner Asphalt Corporation

Henry Corporation  
Koppers Industries, Inc.  
Malarkey Roofing Company  
Meadows, W. R., Inc.  
Sonneborn, Div. Of ChemRex, Inc.  
Tamms Industries

## BITUMINOUS DAMPPROOFING

Fibered Brush and Spray Coats: ASTM D 1227, Type II, Class I.

## MISCELLANEOUS MATERIALS

Emulsified-Asphalt Primer: ASTM D 1227, Type III, Class I, except diluted with water as recommended by manufacturer.

## PART 3 – EXECUTION

### EXAMINATION

Examine substrates, with Applicator present, for compliance with requirements for surface smoothness and other conditions affecting performance of work.

1. Begin dampproofing application only after substrate construction and penetrating work have been completed and unsatisfactory conditions have been corrected.

### PREPARATION

Protection of Other Work: Mask or otherwise protect adjoining exposed surfaces from being stained, spotted, or coated with dampproofing. Prevent dampproofing materials from entering and clogging weep holes and drains.

Clean substrates of projections and substances detrimental to work; fill voids, seal joints, and apply bond breakers if any, as recommended by prime material manufacturer.

### APPLICATION, GENERAL

Comply with manufacturers written recommendations unless more stringent requirements are indicated or required by Project conditions to ensure satisfactory performance of dampproofing.

Apply additional coats if recommended by manufacturer or required to achieve coverage's indicated.



Allow each coat of dampproofing to cure 24 hours before applying subsequent Coats.

Apply dampproofing to provide continuous plane of protection on exterior face of inner wythe of exterior masonry cavity walls.

1. Lap dampproofing at least ¼ inch (6 mm) onto flashing, masonry reinforcement, veneer ties, and other items that penetrate inner wythe.
2. Extend dampproofing over outer face of structural members and concrete slabs that interrupt inner wythe, and lap dampproofing at least ¼ inch (6 mm) onto shelf angles supporting veneer.

#### COLD-APPLIED, EMULSIFIED-ASPHALT DAMPPROOFING

On Exterior Face of Inner Wythe of Cavity Walls: Apply primer and one brush or spray coat at not less than 1 gal./100 sq. ft. (0.4 L/sq.m).

#### CLEANING

Remove dampproofing materials from surfaces not intended to receive dampproofing.

END OF SECTION 07115

## SECTION 07200 – INSULATION

### PART 1 – GENERAL

#### RELATED DOCUMENTS:

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

#### DESCRIPTION OF WORK:

Extent of insulation work is shown on drawings and indicated by provisions of this section.

Applications of insulation specified in this section include the following:

1. Blanket-type at all exterior stud walls.
2. Blanket type building above new ceiling or blown insulation in attic area - Contractors Option.
3. Sound Attenuation at interior stud walls.
4. Cavity Wall Insulation.
5. Foam Insulation at CMU Cells

#### SUBMITTALS

Product Data: Submit manufacturer's product specifications and installation instructions for each type of insulation and vapor barrier material required.

#### PRODUCT HANDLING;

General Protection: Protect insulations from physical damage and from becoming wet, soiled, or covered with ice or snow. Comply with manufacturer's recommendations for handling, storage and protection during installation.

### PART 2 – PRODUCTS

#### **Batt Insulation**

Manufacturers: The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:

Certain-Teed Products Corp.; Valley Forge, PA  
Manville Bldg. Materials Corp.; Denver, CO.  
Owens-Corning Fiberglass Corp.; Toledo, OH.

Equal products of other manufacturers may be used in the work, provided such products have been approved by the Architect, not less than five (5) days prior to scheduled bid opening.

1. Mineral/Glass Fiber Blanket/Batt Insulation (M/GFB-Ins): Inorganic (nonasbestos) fibers formed into resilient flexible blankets or semi-rigid batts; FS HH-1-521. Manufacturer's standard lengths and widths as required to coordinate with spaces to be insulated.
  - a. Above Ceilings: Thickness: R-Factor: **34** as follows:  
**Contractors Option:**  
Provide un-faced batts at exposed wood framed roof areas between the trusses at the bottom cord of joists that will receive interior coverings at the bottom of the system (ie: sheetrock, plywood, concrete, etc.)  

**or**

Granulated Loose fill insulation conforming to Federal Spec. Hh-1-1030, Type I, Class B, in attic area above the air barrier. Labeling shall include the data above as well as the recommended installation density.

### **Cavity Wall Insulation**

Manufacturers: The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:

- "Styrofoam SM/SB"; Dow Chemical USA.
- "Foamular 250"; UC Industries.
- "Certifoam", Minnesota Diversified Products, Inc.

Equal products of other manufacturers may be used in the work, provided such products have been approved by the Architect, not less than five (5) days prior to scheduled bid opening.

1. Extruded Polystyrene Board Insulation: Rigid cellular polystyrene thermal insulation with closed cells and integral high density skin, formed by the exposition of polystyrene base resin in an extrusion process to comply with ASTM C 578, Type IV; 5-year aged **R-value of 7.5 Btu/ (hr x sf x degree F) at 75 degree F in manufacturer's standard lengths and widths; 1 1/2" thick**, unless otherwise indicated. **Install at the cavity space.**
2. Adhesive: Type recommended by insulation board manufacturer for application indicated.

## **CMU Filled Cell Wall Insulation:**

Manufacturers: The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:

"Core-Fill 500", as manufactured by Tailored Chemical Products, Inc.,  
Hickory, NC. Phone: (800) 627-1687: [www.core-fill500.com](http://www.core-fill500.com).

"R501", as manufactured by PolyMaster, Inc.", Knoxville, TN. Phone:  
(800) 580-3626.

"Core Foam Masonry Foam Insulaton" by cfiFOAM, Inc., Knoxville, TN.  
Phone: (800) 656-3626.

Equal products of other manufacturers may be used in the work, provided such products have been approved by the Architect, not less than five (5) days prior to scheduled bid opening.

Filling **masonry cells** with foam insulation from exterior face of Building as follows:

1. Foam Insulation at exterior concrete block wall **cells**: Filling **cells** of concrete masonry with amino-plast foam insulation. Holes for filling cells of masonry shall be drilled at horizontal masonry joint on the exterior side of exposed masonry walls and re-grouted. Installed insulation shall have a **R-10'** value.
2. Reference Standards:
  - a. ASTM C 177 - Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus; 2004.
  - b. ASTM C518 - 01 Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus; 2001.
  - c. ASTM D 1621 - Standard Test Method for Compressive Properties of Rigid Cellular Plastics; 2004a.
  - d. ASTM D 1622 - Standard Test Method for Apparent Density of Rigid Cellular Plastics; 2008.
  - e. ASTM D 2842 - Standard Test Method for Water Absorption of Rigid Cellular Plastics; 2006.
  - f. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2008.
  - g. ASTM E 96/E96M - Standard Test Methods for Water Vapor Transmission of Materials; 2005.
  - h. NFPA 259 - Standard Test Method for Potential Heat of Building Materials
3. Materials:
  - a. Insulation: Aminoplast foam for injection application.
    1. Thermal Resistivity: **R/inch equal to R-4.4/inch @ 75**

**degrees F mean when tested per either ASTM C-177 or ASTM C518.**

2. Water Vapor Transmission: Average  $\leq 15$  perms when tested per ASTM E 96/E96M.
3. Potential Heat:  $\leq 7700$  Btu/lb. when tested per NFPA 259.
4. Cured Density:  $\leq 1.0$  lb/ft<sup>3</sup> (dry) when tested per ASTM D 1622.
5. Surface Burning Characteristics: Class A - Flame Spread  $\leq 25$ , Smoke Developed  $\leq 450$  per ASTM E 84.

**NOTE: Both Cavity Wall Insulation and CMU Filled Cell Wall Insulation is required at all exterior CMU walls.**

### PART 3 – EXECUTION

#### INSPECTION AND PREPARATION:

Installer must examine substrates and conditions under which insulation work is to be performed and must notify Contractor in writing of unsatisfactory conditions. Do not proceed with insulation work until unsatisfactory conditions have been corrected in manner acceptable to Installer.

Clean substrates of substances harmful to insulations or vapor barriers, including removal of projections which might puncture vapor barriers.

Close off openings in cavities to receive poured-in-place and insulation, sufficiently to prevent escape of insulation. Provide bronze or stainless steel screen (inside) where openings must be maintained for drainage or ventilation.

#### INSTALLATION:

##### General:

Comply with manufacturer's instructions for particular conditions of installation in each case. If printed instructions are not available or do not apply to project conditions, consult manufacturer's technical representative for specific recommendations before proceeding with work.

Extend insulation full thickness as shown over entire area to be insulated. Cut and fit tightly around obstructions, and fill voids with insulation. Remove projections which interfere with placement.

##### PROTECTION:

General: Protect installed insulation and vapor barriers from harmful weather exposures and from possible physical abuses, where possible by non-delayed installation of concealing work or, where that is not possible, by temporary covering or

enclosure. Installer shall advise Contractor of exposure hazards, including possible sources of deterioration and fire hazards.

END OF SECTION 07200

## SECTION 07220 - FIRE/SMOKE STOP INSULATION

### PART 1 – GENERAL

#### RELATED DOCUMENTS:

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

#### DESCRIPTION OF WORK:

Extent of firestopping work shall be as follows:

1. Through-penetration firestopping in fire rated construction.
2. Construction-gap firestopping at connections of the same or different materials in fire rated ceiling.
3. Construction -gap firestopping occurring within fire rated wall, floor to floor assemblies.
4. Construction-gap firestopping at expansion joints.
5. Construction-gap firestopping at abutments to existing construction.
6. Construction-gap firestopping occurring at the top of fire rated walls.
7. Through-penetration smoke-stopping in smoke partitions.
8. Construction-gap smoke-stopping in smoke partitions.

#### SUBMITTALS:

Submit product data and manufacturer's certificate that the product meets or exceeds specified requirements.

Before commencing work, submit in accordance with local code.

Submit independent laboratory test reports, data sheets, physical properties, and samples as required by local code officials.

Submit the technical data sheet from the manufacturer showing the test results from the ASTM E84 (Surface Burning Characteristics).

#### QUALITY ASSURANCES

Applicator performing work under this section must be trained by the manufacture in the art of applying related material.

## DELIVERY AND STORAGE OF MATERIALS

All materials shall be delivered in their original unopened packages and stored in an enclosed shelter providing protection from damage and exposure to the elements. Damaged or deteriorated materials shall be removed from the premises.

## PART 2 – PRODUCTS

### DESIGN CONDITIONS

Thermafiber safing insulation or equal shall be one hour and two hour fire tested under simulated field conditions using ASTM E119 guidelines.

1. ASTME 814 - Standard Test Method for Fire Tests of Through-Penetration Fire Stops.
2. International Building Code, 2009 edition.

All materials, unless otherwise indicated, shall be supplied United States Gypsum Company or Tremco Firestopping Systems and shall be installed according to current printed directions.

Systems or devices listed in the U.L. Fire Resistance Directory under categories XHCR and XHEZ may be used, providing that it conforms to the construction type, penetrant type, annular space requirements and fire rating involved in each separate instance, and that the system be symmetrical for wall applications. Systems or devices must be asbestos-free.

All firestopping products must be from a single manufacturer. All trades shall use products from the same manufacturer.

Sealing Compound: Thermafiber Smoke Seal compound or equal, smoke resistant, in 30 oz. cartridges.

## PART 3 – EXECUTION

Verify openings are ready to receive the work of this section.

Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other matter which may affect bond of firestopping material.

Remove incompatible materials which may affect bond.



Install materials in manner described in fire test report and in accordance with manufacturer's instructions, completely closing openings.

Fire Sealant Application: Seal all joints with 3/8" bead of Thermafiber Smoke Seal compound or equal. Top off safing insulation in all poke-through openings with minimum 2" depth of Thermafiber Smoke Seal compound, or equal.

END OF SECTION 07220

## SECTION 07310 – SHINGLES (ARCHITECTURAL)

### PART 1 – GENERAL

#### RELATED DOCUMENTS:

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

#### DESCRIPTION OF WORK:

Extent of shingles is shown on drawings and is hereby defined to include units employed as weather protection for walls as well as for roofs.

Types of shingle applications specified in this section include the following:

1. New Fiberglass shingle roofing and underlayment(s).
2. Ridge Vent

#### QUALITY ASSURANCE:

The Contractor shall engage and pay a Certified Roofing Consultant, approved by Architect, shall attend the pre-roofing conference and provide a certificate of compliance in a start up, in progress and final inspection mode, certifying that the roof system will be approved to receive a **30** year manufacturers warranty.

Recognized approved independent firm will consist of:

Hixson Consultants, Inc.,  
947 1<sup>st</sup> Avenue West,  
Alabaster, AL. 35007  
(205) 663-2220, attention Mr. Tyler Hixson

Roof Asset Management, Inc.  
4950 Woodfield Drive  
Millbrook, Alabama 36054  
(334) 590-7999

UL Listing: Provide labeled materials which have been tested and listed by UL for Class and Rating indicated for each shingle type required.

#### SUBMITTALS:

Product Data: Submit technical product data, installation instructions and recommendations from shingle manufacturer, including data that materials comply with

requirements. Shingles shall be installed in accordance with manufacturer's instructions.

Samples: Submit full range of samples for color and texture selection. After selection, submit 2 full-size shingles for verification of each color/style/texture selected.

Product Handling: Deliver materials in manufacturer's unopened, labeled containers. Store materials to avoid water damage, and store rolled goods on end.

#### JOB CONDITIONS:

Substrate: Proceed with shingle work only after substrate construction and penetrating work have completed.

Weather Conditions: Proceed with shingle work only when weather conditions are in compliance with manufacturer's recommendations and when substrate is completely dry.

#### SPECIFIED PRODUCT WARRANTY:

The roofing manufacture shall be required to provide documentation certifying that the roof design provided complies with the performance requirements as set forth in IBC Chapter 15, Section 1504. The documentation shall be attached to the roof warranty at the close out of the project.

Provide shingle manufacturer's warranty on installed work, agreeing to pay for repair or replacement of defective shingles as necessary to eliminate leaks. Period of warranty is **30 years from date of substantial completion of Project.**

Standard manufacturer's roofing guarantees which contain language regarding the governing of the guarantee by any state other than the State of Alabama, must be amended to exclude such language, and substituting the requirement that the Laws of the State of Alabama shall govern all such guarantees.

All roof warranty's shall be provided to the Owner, by the Contractor at the Final Inspection to obtain the Substantial Completion.

#### SPECIAL PROJECT WARRANTY:

Contractor shall furnish Contractors 5 year Alabama Building Commission Roofing Guarantee.

Warranty shall include the following: The General Contractor and Roofing Installer shall be responsible for all water damaged materials due to roof leaks for a period of 5 years.

## PART 2 – PRODUCTS

### SHINGLES

Architectural Shingles, UL Class "A": Mineral-surfaced, self-sealing, fiberglass based asphalt strip shingles complying with ASTM D 3018, Type I, bearing UL Class "A" external fire exposure label and UL "Wind Resistant" label. Color to be selected by the Architect from manufactures standards.

Equal to Owens-Corning Duration Series, 130 mph wind warranty.

Manufacturers: The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:

GAF  
Celotex.  
Elk

Impact Resistance: Roof coverings installed on low-slope roofs (roof slope <2:12) shall resist impact damage based on the results of tests conducted in accordance with ASTM D 3746, ASTM D 4272, CGSB 37-GP-52M or the "Resistance to Foot Traffic Test " FM 4470.

Felt Underlayment: One layer of a Class A synthetic flame retardant underlayment with following requirements:

1. Products shall be equal to Palisade SDP Advanced Polymer Products, or equal products as manufactured by GAF, Tamko, ELK or CertainTeed.
  - a. Tensile Strength – ASTM D226 – 150lbs
  - b. Tear Strength – ASTM D4533 – 50lbs
  - c. Puncture Strength – ASTM D751 – 300 psi
  - d. UV Rating – ASTM G90 – 90%
  - e. Permeability – ASTM 96-A – 0.10 Perms
  - f. Install with roofing nails – no staples will be allowed.

Underlayment at Valleys, Ridges, Hips and Eaves: Supply 40 mil self adhering ice and water shield membrane equal to Carlisle: "Dri-Start A", Palisade SA-HT or Tamko "Moisture Guard Plus". Install 2'-0" in each direction from middle of all valleys. Install upward from the edge of all eaves a total distance of 72". Install on all ridges and hips a distance of 36" on each side of all ridge and hip lines. 18" wide strip each side of expansion joint flange.

#### TECHNICAL DATA

#### TEST METHOD

#### TYPICAL VALUE

Color  
Top Surface

KOOL BLUE™  
STRONGHOLD™ Anti-Skid

18-144

SHINGLES (ARCHITECTURAL)

07310 - 3

Bottom Release Liner		Technology: Polymer
Permeability	ASTM E96	Silicone Split Release Poly
Nominal Thickness	ASTM D1777	00 0.01 perms
Nail Sealability	ASTM D1970	40 mil (1 mm)
Lap Sealability	ASTM D1970	Pass
Tensile Strength	ASTM D226	Pass
Tear Strength	ASTM D4523	121 lbf/in. (21kN/m)
Elongation	ASTM D2523-00	160 lbf/in. (28 kN/m)
Low Temperature Flexibility	ASTM D1970	16%
Adhesion to Plywood	ASTM D1876	-22 F (-30 C) - Pass
Adhesion to Plywood	ASTM D1876	55 lbf/in.:75 F (9.6 kN/m: 24 C)
UV Exposure	ASTM G90	23 lbf/in.: 40 F (4 kN/m: 4.4 C)
Temperature Range	ASTM D1970	6 months
		LT: 15 F (-9 C) to HT: 250 F
		(121 C)
Dimensions		36 in. x 66.7 ft.
		(91.4 cm x 20.3 m)

**All valleys shall be “California Cut”.**

**Fixed Ridge Vents:**

1. Ridge vent shall be equal to V-600 by Cor-A-Vent, 11” wide, 18 square inches NFVA per lin. ft., or approved equal.

Equal manufactures are:  
 CertainTeed 12” Filtered Ridge Vent  
 GAF Cobra Ridge Vent 3

**PART 3 – EXECUTION**

Installer of shingles must examine substrate and conditions under which shingling work is to be performed and must notify Contractor in writing of unsatisfactory conditions. Do not proceed with shingling work until unsatisfactory conditions have been corrected in manner acceptable to Installer.

**PRE-ROOFING CONFERENCE:**

A pre-roofing conference is required before any roofing materials are installed. This conference shall be conducted by a representative of the Architect and attended by representatives of the Owner, Building Commission Inspector, General Contractor, Roofing Contractor, Sheet Metal Contractor, Roof Deck Manufacturer (if applicable), and the Roofing Materials Manufacturer (if warranty is required of this manufacturer). If equipment of substantial size is to be placed on the roof, the Mechanical Contractor must also attend this meeting. Provide at least 72 hours advance notice to participants

prior to convening pre-roofing conference.

The pre-roofing conference is intended to clarify demolition and application requirements for work to be completed before roofing operations can begin. This would include a detailed review of the specifications, roof plans, roof deck information, flashing details, and approved shop drawings, submittal data, and samples. If conflict exists between the specifications and the Manufacturer's requirements, this shall be resolved. If this pre-roofing conference cannot be satisfactorily concluded without further inspection and investigation by any of the parties present, it shall be reconvened at the earliest possible time to avoid delay of the work. In no case should the work proceed without inspection of all roof deck areas and substantial agreement on all points.

The following are to be accomplished during the conference:

1. To review all Factory Mutual and Underwriters Laboratories requirements listed in the specifications and resolve any questions or conflicts that may arise.
2. To establish trade-related job schedules, including the installation of roof mounted mechanical equipment.
3. To establish roofing schedule and work methods that will prevent roof damage.
4. Require that all roof penetrations and walls be in place prior to installing the roof.
5. To establish those areas on the job site that will be designated as work and storage areas for roofing operations.
6. To establish weather and working temperature conditions to which all parties must agree.
7. To establish acceptable methods of protecting the finished roof if any trades must travel across or work on or above any areas of the finished roof.

The Architect shall prepare a written report indicating actions taken and decisions made at this pre-roofing conference. This report shall be made a part of the project record and copies furnished the General Contractor, the Owner, the Building Commission, and the Building Commission Inspector."

#### PREPARATION OF SUBSTRATE:

Clean substrate of any projections and substances detrimental to shingling work.

Coordinate installation of shingles with flashing and other adjoining work to ensure proper sequencing.

#### INSTALLATION:

General: Comply with instructions and recommendations of shingle manufacturer in relationship to low slop roof application, except to extent more stringent requirements are indicated.

SHINGLES:

Underlayment: Apply ice and water shield underlayment at all Valleys, Ridges, Hips and Eaves. Apply one layer felt underlayment horizontally over entire surface, lapping succeeding courses 2" minimum and fastening with sufficient nails (no staples) to hold in place until shingle application. Install saturated felt starter courses as per low slope application requirements lapped and cemented as indicated by the manufacturer. Selection and application of asphalt roofing and siding products published by the Asphalt Roofing Manufacturers' Association Copyright 1966 Revised 1974.

Shingles: Install starter strip of roll roofing or shingles with tabs removed. Fasten asphalt shingles to roof sheathing with nails. The application of the shingles will be by hand and the application pattern will be diagonally across the slope of the roof. "Racking" of the shingles will not be permitted. Pneumatic nail guns will not be permitted for installation of shingles. Staples will not be permitted.

END OF SECTION 07310

## SECTION 07460 – FIBER CEMENT SIDING

### PART 1 – GENERAL

#### RELATED DOCUMENTS:

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

#### DESCRIPTION OF WORK:

Factory-finished fiber cement siding.

#### RELATED SECTIONS

1. Section 06100 - Rough Carpentry: Wood framing and bracing.
2. Section 06100 - Rough Carpentry: Sheathing.
3. Section 07200 - Insulation: Exterior wall insulation.

#### REFERENCES

- A. AS D3359 - Standard Test Method for Measuring Adhesion by Tape Test, Tool and Tape.
- B. AS E136 - Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750 degrees C.

#### SUBMITTALS

Product Data: Manufacturer's data sheets on each product to be used, including:

1. Preparation instructions and recommendations.
2. Storage and handling requirements and recommendations.
3. Installation methods.

Shop Drawings: Provide detailed drawings of atypical non-standard applications of cementitious siding materials which are outside the scope of the standard details and specifications provided by the manufacturer.

Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.



Verification Samples: For each finish product specified, two samples, minimum size 4 by 6 inches (100 by 150 mm), representing actual product, color, and patterns.

## QUALITY ASSURANCE

Installer Qualifications: Minimum of 2 years experience with installation of similar products.

## DELIVERY, STORAGE, AND HANDLING

Store products in manufacturer's unopened packaging until ready for installation.

Store siding on edge or lay flat on a smooth level surface. Protect edges and corners from chipping. Store sheets under cover and keep dry prior to installing.

Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

## PROJECT CONDITIONS

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

## WARRANTY

Product Warranty: Limited, non-pro-rated product warranty.

1. HardiePanel HZ10 vertical siding for 30 years.

Finish Warranty: ColorPlus finish and technology for 15 years - will not peel; will not crack; and will not chip. Finish warranty includes the coverage for labor and material.

Workmanship Warranty: Application limited warranty for 2 years.

## PART 2 – PRODUCTS

Manufacturers: The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:

James Hardie Building Products, Inc. (Basis of Design)  
Cemplank Corporation  
Certain Teed Corporation

Equal products of other manufacturers may be used in the work provided such products have been approved by the Architect, not less than five (5) days prior to scheduled bid opening.

## SIDING

Vertical Siding: HardiePanel HZ10 Siding by James Hardie Building Products, Inc.

1. Type: Stucco Vertical siding panel 4 feet by 10 feet (1219 mm by 3048 mm)
2. Finish: Siding to have ColorPlus Technology.

Vertical siding requirement for Materials:

1. Fiber-cement siding - complies with ASTM C 1186 Type A Grade II.
2. Fiber-cement siding - complies with ASTM E 136 as a noncombustible material.
3. Fiber-cement siding - complies with ASTM E 84 Flame Spread Index = 0, Smoke Developed Index = 5.

## FASTENERS

All fasteners to be corrosion resistant.

Fasten siding and trim according to manufacturers recommendations for product and installation warranties, according to all applicable building codes and according to applicable building code compliance reports for maximum basic wind speed for exposure category and applicable shear values.

## FINISHES

Factory Primer: Provide factory applied universal primer.

Factory Finish:

1. Product: ColorPlus Technology by James Hardie.
2. Definition: Factory applied finish; defined as a finish applied in the same facility and company that manufactures the siding substrate.
3. Process:
  - a. Factory applied finish by fiber cement manufacturer in a controlled environment within the fiber cement manufacturer's own facility utilizing a multi-coat, heat cured finish within one manufacturing process.
  - b. Each finish color must have documented color match to delta E of 0.5 or better between product lines, manufacturing

lots or production runs as measured by photospectrometer and verified by third party.

4. Protection: Factory applied finish protection such as plastic laminate that is removed once siding is installed
5. Accessories: Complete finishing system includes pre-packaged touch-up kit provided by fiber cement manufacturer. Provide quantities as recommended by manufacturer.
6. Color(s) to be selected from ColorPlus Color Palette by owner/architect.

### PART 3 – EXECUTION

#### EXAMINATION

Do not begin installation until substrates have been properly prepared.

If framing preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

Nominal 2 inch by 4 inch (51 mm by 102 mm) wood framing selected for minimal shrinkage and complying with local building codes, including the use of water-resistive barriers or vapor barriers where required. Minimum 1-1/2 inches (38 mm) face and straight, true, of uniform dimensions and properly aligned.

1. Install water-resistive barriers and claddings to dry surfaces.
2. Repair any punctures or tears in the water-resistive barrier prior to the installation of the siding.
3. Protect siding from other trades.

Metal framing provisions: Minimum 20 gauge 3-5/8 inch (92 mm) C-Stud 16 inches maximum on center or 16 gauge 3-5/8 inches (92 mm) C-Stud 24 inches (610 mm) maximum on center metal framing complying with local building codes, including the use of water-resistive barriers and/or vapor barriers where required. Minimum 1-1/2 inches (38 mm) face and straight, true, of uniform dimensions and properly aligned.

1. Install water-resistive barriers and claddings to dry surfaces.
2. Repair any punctures or tears in the water-resistive barrier prior to the installation of the siding.
3. Protect siding from other trades.

## PREPARATION

Clean surfaces thoroughly prior to installation.

Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

Install a water-resistive barrier as indicated in drawings and specifications.

The water-resistive barrier must be appropriately installed with penetration and junction flashing in accordance with local building code requirements.

Install Engineered for Climate HardieWrap weather barrier in accordance with local building code requirements.

Use HardieWrap Seam Tape and joint and laps.

Install HardieWrap flashing. HardieWrap Flex Flashing.

## INSTALLATION VERTICAL SIDING

- A. Install materials in strict accordance with manufacturer's installation instructions.
- B. Block framing between studs where HardiePanel siding horizontal joints occur.
- C. Install metal Z flashing and provide a 1/4 inch (6 mm) gap at horizontal panel joints.
- D. Place fasteners no closer than 3/8 inch (9.5 mm) from panel edges and 2 inches (51 mm) from panel corners.
- E. Allow minimum vertical clearance between the edge of siding and any other material in strict accordance with the manufacturer's installation instructions.
- F. Maintain clearance between siding and adjacent finished grade.
- G. Specific framing and fastener requirements refer to Tables 2 and 3 in National Evaluation Service Report No. NER-405.
- H. Factory Finish Touch Up: Apply touch up paint to cut edges in accordance with manufacturer's printed instructions.
  - 1. Touch-up nicks, scrapes, and nail heads in pre-finished siding using the manufacturer's touch-up kit pen.
  - 2. Touch-up of nails shall be performed after application, but before plastic protection wrap is removed to prevent spotting of touch-up finish.
  - 3. Use touch-up paint sparingly. If large areas require touch-up, replace the damaged area with new pre-finished siding. Match touch up color to siding color through use of manufacturer's branded touch-up kits.

## PROTECTION

Protect installed products until completion of project.

Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION 07460

## SECTION 07600 - FLASHING AND SHEET METAL

### PART 1 – GENERAL

#### RELATED DOCUMENTS:

Drawings and general provisions of the contract including General and Supplementary Conditions and Division 1 Specification Sections apply to work of this section.

#### DESCRIPTION OF WORK:

Extent of each type of flashing and sheet metal work is indicated on drawings and by provisions of this section.

Types of work specified in this section include the following:

1. Metal counter flashing; and base flashing (if any).
2. Metal eave strips and diverters. Verify location with Architect for all entry doors.
3. Exposed metal trim units, drip edge, flashing, fascia, gutters, downspouts, etc.
4. Metal vented and non-vented soffit systems.
5. Elastic flashing.
6. Elastic roof/wall expansion joint systems.

Integral masonry flashings are specified as masonry work in sections of Division 4.

#### SUBMITTALS:

Product Data; Flashing, Sheet Metal, Accessories: Submit manufacturer's product data, installation instructions and general recommendations for each specified sheet material and fabricated product.

#### JOB CONDITIONS:

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

### PART 2 - PRODUCTS

Sheet Metal Flashing, Trim, Drip Edge, Fascia, Flashing, Gutters, Downspouts: ASTM B 209, alloy 3003, temper H14, Kynar 500, 70% finish, 0.032" thick aluminum.

### Non-Perforated and Perforated Metal Soffit System:

Aluminum soffit shall be equal to Ply Gem/Mastic aluminum soffit, Envoy V-Groove, AlumaLure 2000 finish, .019" thick, 12" exposure or as indicated on drawings. Color to be selected by architect.

**Soffit panel to be perforated for ventilation, (15 sq. in/Lin. ft.).**

Equal manufactures are:  
Alside Aluminum Soffits  
Kaycan Aluminum

Elastic Sheet Flashing/Membrane: Manufacturer's standard flexible, elastic, black, nonreinforced, flashing sheet of 50 - 65 mils thickness.

1. Provide EPDM synthetic rubber sheet equal to Nervastral Seal Pruf HD-20 except where metal is indicated.

### Miscellaneous Materials and Accessories:

Solder: For use with steel or copper, provide 50 - 50 tin/lead solder (ASTM B 32), with rosin flux.

Fasteners: Same metal as flashing/sheet metal or, other noncorrosive metal as recommended by sheet manufacturer. Match finish of exposed heads with material being fastened.

Bituminous Coating: FS TT-C-494 or SSPC - Paint 12, solvent type bituminous mastic, nominally free of sulfur, compounded for 15-mil dry film thickness per coat.

Mastic Sealant: Polyisobutylene; nonhardening, nonskinning, non-drying, nonmigrating sealant.

Epoxy Seam Sealer: 2-part noncrossive metal seam cementing compound, recommended by metal manufacturer for exterior/interior non-moving joints including riveted joints.

Adhesives: Type recommended by flashing sheet manufacturer for waterproof/ weather-resistant seaming and adhesive application of flashing sheet.

Paper Slip Sheet: 5-lb. rosin-sized building paper.

Polyethylene Underlayment: 6-mil carbonated polyethylene film; FS L-P-512.

Reglets: Metal or plastic units of type and profile indicated, compatible with flashing indicated, noncrossive.

Metal Accessories: Provide sheet metal clips, straps, anchoring devices and similar accessory units as required for installation of work, matching or compatible with material being installed, noncrossive, size and gage required for performance.

Roofing Cement: Must be compatible with materials with which it comes in contact.

### FABRICATED UNITS:

General Metal Fabrication: Shop-fabricate work to greatest extent possible. Comply with details shown, and with applicable requirements of SMACNA "Architectural Sheet Metal Manual" and other recognized industry practices. Fabricate for waterproof and weather-resistant performance; with expansion provisions for running work, sufficient to permanently prevent leakage, damage or deterioration of the work. Form work to fit substrates. Comply with material manufacturer instructions and recommendations for forming material. Form exposed sheet metal work without excessive oil-canning, buckling and tool marks, true to line and levels indicated, with exposed edges folded back to form hems.

Seams: Fabricate nonmoving seams in sheet metal with flat-lock seams. For metal other than aluminum, tin edges to be seamed, form seams, and solder. Form aluminum seams with epoxy seam sealer; rivet joints for additional strength where required.

Expansion Provisions: Where lapped or bayonet-type expansion provisions in work cannot be used, or would not be sufficiently water/weatherproof, form expansion joints of intermeshing hooked flanges, not less than 2" deep, filled with mastic sealant (concealed within joints).

Sealant Joints: Where movable, non-expansion type joints are indicated or required for proper performance of work, form metal to provide for proper installation of elastomeric sealant, in compliance with SMACNA standards.

Separations: Provide for separation of metal from noncompatible metal or corrosive substrates by coating concealed surfaces at locations of contact, with bituminous coating or other permanent separation as recommended by manufacturer/fabricator.

## PART 3 - EXECUTION

### INSTALLATION REQUIREMENTS:

General: Except as otherwise indicated, comply with manufacturer's installation instructions and recommendations, and with SMACNA "Architectural Sheet Metal Manual".



Anchor units of work securely in place by methods indicated, providing for thermal expansion of metal units; conceal fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints and seams which will be permanently watertight and weatherproof.

Underlayment: Where aluminum is to be installed directly on cementitious or wood substrates, install a slip sheet of red rosin paper and a course of polyethylene underlayment.

Bed flanges of work in a thick coat of bituminous roofing cement where required for waterproof performance.

Install reglets to receive counter-flashing in manner and by methods indicated. Where shown in concrete, furnish reglets to trades of concrete work for installation as work of Division-3 sections. Where shown in masonry, furnish reglets to trades of masonry work, for installation as work of Division-4 sections.

1. Install counter-flashing in reglets, either by snap-in seal arrangement, or by wedging in place for anchorage and filling reglet with mastic or elastomeric sealant, as indicated and depending on degree of sealant exposure.

#### CLEANING AND PROTECTION:

Clean exposed metal surfaces, removing substances which might cause corrosion of metal or deterioration of finishes.

Protection: Installer shall advise Contractor of required procedures for surveillance and protection of flashings and sheet metal work during construction, to ensure that work will be without damage or deterioration, other than natural weathering, at time of substantial completion.

END OF SECTION 07600

## SECTION 07900 - JOINT SEALERS

### PART 1 – GENERAL

#### RELATED DOCUMENTS:

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

#### DESCRIPTION OF WORK:

The extent of each form and type of joint sealer is indicated on drawings and by provisions of this section.

The applications for joint sealers as work of this section include the following:

1. Joints (Interior).
2. Joints (Exterior).
3. Flashing Joints.
4. Interior wall/ceiling joints.

General Performance: Except as otherwise indicated, joint sealers are required to establish and maintain airtight and waterproof continuous seals on a permanent basis, within recognized limitations of wear and aging as indicated for each application. Failures of installed sealers to comply with this requirement will be recognized as failures of materials and workmanship.

#### SUBMITTALS:

Product Data: Submit manufacturer's product specifications, handling/installation/curing instructions, and performance tested data sheets for each elastomeric product required.

#### JOB CONDITIONS:

Weather Conditions: Do not proceed with installation of liquid sealants under unfavorable weather conditions. Install elastomeric sealants when temperature by manufacturer for installation.

### PART 2 – PRODUCTS

#### ACCEPTABLE MANUFACTURERS:

General: manufacturers listed in this article include those known to produce the indicated category of prime joint sealant material, either as a nominally pure generic product or as

an equivalent-performance modification thereof or proprietary product.

Manufacturers: The following manufacturer's products have been used to establish minimum standards for materials, workmanship and function:

1. Acrylic Emulsion Latex Sealants:  
Bostik.  
Pecora Corp.  
Sonneborn Building Products.  
Tremco, Inc.
2. Polyurethane Sealants:  
Bostik.  
Master Builders.  
Pecora Corp.  
Sonneborn Building Products.  
Tremco, Inc.
3. Butyl Sealants:  
Bostik.  
TEC Incorporated.  
Tremco, Inc.

Equal products of other manufacturers may be used in the work, provided such products have been approved by the Architect, not less than five (5) days prior to scheduled bid opening.

MATERIALS:

NOTE: The use of silicone sealants shall not be used at any exterior conditions.

General Purpose Exterior Sealant: Polyurethane; ASTM C 920, Grade NS, Class 25, Uses M, G, and A; single component. (Silicone sealant shall not be used at exterior conditions).

1. Color: Standard colors matching finished surfaces.
2. Applications: Use for:
  - a. Control, expansion, and soft joints in masonry, stone or concrete.
  - b. Joints between concrete and other materials.
  - c. Joints between metal frames and other materials.
  - d. Other exterior joints for which no other sealant is indicated.

Exterior Metal Lap Joint Sealant: Butyl or polyisobutylene, nondrying, nonskinning, noncuring.

1. Applications: Use for:
  - a. Concealed sealant bead in sheet metal work.

General Purpose Interior Sealant: Acrylic emulsion latex; ASTM C 834, single component, paintable.

1. Color: Standard colors matching finished surfaces.
2. Applications: Use for:
  - a. Interior wall and ceiling control joints.
  - b. Joints between door and window frames and wall surfaces.
  - c. Other interior joints for which no other type of sealant is indicated.

Acoustical Sealant: Butyl or acrylic sealant; ASTM C 920, Grade NS, Class 12-1/2, Uses M and A; single component, solvent release curing, nonskinning.

1. Applications: Use for concealed locations only:
  - a. Sealant bead between top stud runner and structure and between bottom stud track and floor or wall.

Paving Joint Sealant: Polyurethane, self-leveling; ASTM C 920, Class 25, Uses T, M and A; single component.

1. Color: Standard color matching finished surfaces.
2. Applications: Use for:
  - a. Joints in sidewalks and paving, either vehicular or pedestrian.
  - b. Isolation joints and control joints in slabs on grade.

Bituminous and Fiber Joint Filler (BtmF-JF) provide resilient and non-extruding type premolded bituminous-impregnated fiberboard units complying with ASTM D 1751; FS HH-F-341, Type I; or AASHTO M213.

Miscellaneous Materials:

Joint Primer/Sealer: Provide type of joint primer/sealer recommended by sealant manufacturer for joint surfaces to be primed or sealed.

Bond Breaker Tape (BB-Tp): Provide polyethylene tape or other plastic tape as recommended by sealant manufacturer, to be applied to sealant-contact surfaces where bond to substrate or joint filler must be avoided for proper performance of sealant. Provide self-adhesive tape where applicable.

Sealant Backer Rod (S-BR): provide compressible rod stock of polyethylene foam, polyurethane foam, polyethylene jacketed polyurethane foam, butyl rubber foam, neoprene foam or other recommended by sealant manufacturer for back-up of and compatibility with sealant. Where used with hot-applied sealant, provide heat-resistant type which will not be deteriorated by sealant application temperature as indicated.

## PART 3 – EXECUTION

### INSPECTION:

Installer must examine substrate, (joint surfaces) and conditions under which joint sealer work is to be performed and must notify Prime Contractor of unsatisfactory conditions.

### JOINT PREPARATION:

Clean joint surfaces immediately before installation of gaskets, sealants or caulking compounds. Remove dirt, insecure coatings, moisture and other substrate which could interfere with seal of gasket or bond of sealant or caulking compound. Etch concrete and masonry joint surfaces as recommended by sealant manufacturer. Roughen vitreous and glazed joint surfaces as recommended by sealant manufacturer.

Prime or seal joint surfaces where indicated, and where recommended by sealant manufacturer. Confine primer/sealer to areas of sealant bond; do not allow spillage or migration onto adjoining surfaces.

### INSTALLATION:

Comply with manufacturer's printed instructions except where more stringent requirements are shown on specified, and except where manufacturer's technical representative directs otherwise.

Set joint filler units at depth or position in joint as indicated to coordinate with other work, including installation of bond breakers, backer rods and sealant. Do not leave voids or gaps between ends of joint filler units.

Install sealant backer rod for liquid-applied sealants, except where shown to be omitted or recommended to be omitted by sealant manufacturer for application indicated.

Install bond breaker tape where indicated and where required by manufacturer's recommendations to ensure that liquid-applied sealants will perform as intended.

Employ only proven installation techniques, which will ensure that sealants are deposited in uniform, continuous ribbons without gaps or air pockets, with complete "wetting" of joint bond surfaces equally on opposite sides. Except as otherwise indicated, fill sealant rabbet to a slightly concave surface, slightly below adjoining surfaces. Where horizontal joints are between a horizontal surface and vertical surface, fill joint to form a slight cove, so that joint will not trap moisture and dirt.

Install sealant to depths as shown or, if not shown, as recommended by sealant manufacturer but within the following general limitations, measured at center (thin) section of beads;

For normal moving joints sealed with elastomeric sealants but not subject to traffic, fill joints to a depth equal to 50% of joint width, but neither more than 1/2" deep nor less than 1/4" deep.

Spillage: Do not allow sealants or compounds to overflow from confines of joints, or to spill onto adjoining work, or to migrate into voids of exposed finishes. Clean adjoining surfaces by whatever means may be necessary to eliminate evidence of spillage.

Recess exposed edges of gaskets and exposed joint fillers slightly behind adjoining surfaces, unless otherwise shown, so that compressed units will not protrude from joints.

Bond ends of gaskets together with adhesive of "weld" by other means as recommended by manufacturer to ensure continuous watertight and airtight performance. Miter-cut and bond ends at corners unless molded corner units are provided.

#### CURE AND PROTECTION:

Cure sealants and caulking compounds in compliance with manufacturer's instructions and recommendations, to obtain high early bond strength, internal cohesive strength and surface durability. Advise Prime Contractor of procedures required for cure and protection of joint sealers during construction period, so that they will be without deterioration or damage (other than normal wear and weathering) at time of substantial completion. Cure and protect sealants in manner which will minimize increases in modulus of elasticity and other accelerated aging effects. Replace or restore sealants which are damaged or deteriorated during construction period.

END OF SECTION 07900

## SECTION 08100 - STEEL DOORS AND FRAMES

### PART 1 – GENERAL

#### RELATED DOCUMENTS:

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

#### SUMMARY

This Section includes steel doors and frames.

Related Sections: The following Sections contain requirements that relate to this Section:

1. Division 4 Section "Unit Masonry" for building anchors into and grouting frames in masonry construction.
2. Division 8 Section "Wood Doors" for solid-core wood doors installed in steel frames.
3. Division 8 Section "Finish Hardware" for door hardware and weatherstripping.
4. Division 8 Section "Glazing" for glass in steel doors and sidelights.
5. Division 9 Section "Gypsum Board Assemblies".
6. Division 9 Section "Painting".

#### SUBMITTALS

General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.

Product Data for each type of door and frame specified, including details of construction, materials, dimensions, hardware preparation, core, label compliance, sound ratings, profiles, and finishes.

Shop Drawings showing fabrication and installation of steel doors and frames. Include details of each frame type, elevations of door design types, conditions at openings, details of construction, location and installation requirements of door and frame hardware and reinforcements, and details of joints and connections. Show anchorage and accessory items.

Door Schedule: Submit schedule of doors and frames using same reference numbers for details and openings as those on Contract Drawings.

1. Indicate coordination of glazing frames and stops with glass and glazing

requirements.

Samples for initial selection in the form of manufacturer's color charts showing the full range of colors available for factory-finished doors and frames.

Samples for verification of each type of exposed finish required, prepared on Samples not less than 3 by 5 inches (75 by 125 mm) and of same thickness and material indicated for final unit of Work. Where finishes involve normal color and texture variations, include Sample sets showing the full range of variations expected.

Oversize Construction Certification: For door assemblies required to be fire rated and exceeding limitations of labeled assemblies, submit certification of a testing agency acceptable to authorities having jurisdiction that each door and frame assembly has been constructed to conform to design, materials, and construction equivalent to requirements for labeled construction.

## QUALITY ASSURANCE

Provide doors and frames complying with ANSI/SDI 100 "Recommended Specifications for Standard Steel Doors and Frames" and as specified.

Fire-Rated Door Assemblies: Units that comply with NFPA 80, are identical to door and frame assemblies tested for fire-test-response characteristics per ASTM E 152, and are labeled and listed by UL, Warnock Hersey, or another testing and inspecting agency acceptable to authorities having jurisdiction.

1. Oversize Fire-Rated Door Assemblies: For units exceeding sizes of tested assemblies, provide certification by a testing agency acceptable to authorities having jurisdiction that doors conform to all standard construction requirements of tested and labeled fire-rated door assemblies except for size.
2. Temperature-Rise Rating: Where indicated, provide doors that have a temperature-rise rating of 450 deg F (250 deg C) maximum in 30 minutes of fire exposure.

## DELIVERY, STORAGE AND HANDLING

Deliver doors and frames cardboard-wrapped or crated to provide protection during transit and job storage. Provide additional protection to prevent damage to finish of factory-finished doors and frames.

Inspect doors and frames on delivery for damage. Minor damages may be repaired provided refinished items match new work and are acceptable to Architect; otherwise, remove and replace damaged items as directed.



Store doors and frames at building site under cover. Place units on minimum 4-inch- (100-mm-) high wood blocking. Avoid using non-vented plastic or canvas shelters that could create a humidity chamber. If cardboard wrappers on doors become wet, remove cartons immediately. Provide minimum 1/4-inch (6-mm) spaces between stacked doors to promote air circulation.

## PART 2 – PRODUCTS

### MANUFACTURERS

Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

Steel Doors and Frames:

1. Pioneer Industries
2. Rocky Mountain Metals, Inc.
3. Republic Doors & Frames/Allegion

### MATERIALS

Hot-Rolled Steel Sheets and Strip: Commercial-quality carbon steel, pickled and oiled, complying with ASTM A 569 (ASTM A 569M).

Cold-Rolled Steel Sheets: Carbon steel complying with ASTM A 366 (ASTM A 366M), commercial quality, or ASTM A 620 (ASTM A 620M)

Galvannealed Steel Sheets: Galvannealed Steel Sheet: ASTM A 653/ A 653M, commercial quality, hot dipped. Coating Thickness: A60 coating..

Supports and Anchors: Fabricated from not less than 0.0478-inch- (1.2-mm-) thick steel sheet; 0.0516-inch- (1.3-mm-) thick galvanized steel where used with galvanized steel frames.

Inserts, Bolts, and Fasteners: Manufacturer's standard units. Where items are to be built into exterior walls, hot-dip galvanize complying with ASTM A 153, Class C or D as applicable.

### DOORS

Steel Doors: Provide 1-3/4-inch- (44-mm-) thick doors of materials and ANSI/SDI 100 grades and models specified below, or as indicated on Drawings or schedules:

1. Interior Doors: Grade 2, heavy-duty, Model 1, visible edge seam design, 18 gauge / minimum 0.0478-inch thick cold-rolled steel sheet faces.
2. Exterior Doors: Grade 3, heavy-duty, Model 1, visible edge seam design, 16 gauge / minimum 0.0635-inch thick A60 galvanized steel sheet faces.

Door Louvers: Provide louvers according to SDI 111C for interior doors where indicated, with blades or baffles formed of 0.0239-inch- (0.6-mm-) thick cold-rolled steel sheet set into minimum 0.0359-inch- (0.9-mm-) thick steel frame.

1. Sight-Proof Louvers: Stationary louvers constructed with inverted V-shaped or Y-shaped blades.

Low Profile Lite Kits: All lite kits must be minimum 18 ga. cold rolled steel, mitered and welded corners, welded reinforcing clips at corners, counter-sunk mounting screw- holes.

## FRAMES

Provide metal frames for doors, transoms, sidelights, borrowed lights, and other openings, according to ANSI/SDI 100, and of types and styles as shown on Drawings and schedules. Conceal fastenings, unless otherwise indicated. Fabricate frames as follows:

1. Fabricate frames with mitered or coped and face welded corners.
2. Interior Frames: 16 gage cold rolled steel
3. Exterior Frames: 14 gage A60 galvanized steel.

Door Silencers: Except on weather stripped frames, drill stops to receive 3 silencers on strike jambs of single-door frames and 2 silencers on heads of double-door frames.

Plaster Guards: Provide minimum 0.0179-inch- (0.45-mm-) thick steel plaster guards or mortar boxes at back of hardware cutouts where mortar or other materials might obstruct hardware operation and to close off interior of openings.

Grout: When required in masonry construction, as specified in Division 4 Section "Unit Masonry."

## FABRICATION

Fabricate steel door and frame units to be rigid, neat in appearance, and free from defects, warp, or buckle. Where practical, fit and assemble units in

manufacturer's plant. Clearly identify work that cannot be permanently factory assembled before shipment, to assure proper assembly at Project site. Comply with ANSI/SDI 100 requirements.

1. Internal Construction: One of the following manufacturer's standard core materials according to SDI standards:
  - a. Interior Doors: 3/4" Cell Honeycomb
  - b. Exterior Doors: Insulated Polystyrene
2. Clearances: Not more than 1/8 inch (3.2 mm) at jambs and heads, except not more than 1/4 inch (6.4 mm) between non-fire-rated pairs of doors. Not more than 3/4 inch (19 mm) at bottom.
  - a. Fire Doors: Provide clearances according to NFPA 80.

Tolerances: Comply with SDI 117 "Manufacturing Tolerances Standard Steel Doors and Frames."

Galvannealed Steel Doors, Panels, and Frames: For the following locations, fabricate doors, panels, and frames from galvannealed steel sheet according to SDI 112.

1. At exterior locations.
2. Where indicated.

Close top and bottom edges of doors flush as an integral part of door construction or by addition of minimum 0.0635-inch- (1.6-mm-) thick galvanized steel channels, with channel webs placed even with top and bottom edges. Seal joints in top edges of doors against water penetration.

Exposed Fasteners: Unless otherwise indicated, provide countersunk flat or oval heads for exposed screws and bolts.

Thermal-Rated (Insulating) Assemblies: At exterior locations and elsewhere as shown or scheduled, provide doors fabricated as thermal-insulating door and frame assemblies and tested according to ASTM C 236 or ASTM C 976 on fully operable door assemblies.

1. Unless otherwise indicated, provide thermal-rated assemblies with U- value rating of 0.41 Btu/sq. ft. x h x deg F (2.33 W/sq. m x K) or better

Hardware Preparation: Prepare doors and frames to receive mortised and concealed hardware according to final door hardware schedule and templates provided by hardware supplier. Comply with applicable requirements of SDI 107 and ANSI A115 Series specifications for door and frame preparation for hardware.

1. For concealed overhead door closers, provide space, cutouts, reinforcing, and provisions for fastening in top rail of doors or head of frames, as applicable.

Reinforce doors and frames to receive surface-applied hardware. Drilling and tapping for surface-applied hardware may be done at Project site.

Locate hardware as indicated on Shop Drawings or, if not indicated, according to the Door and Hardware Institute's (DHI) "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."

Glazing Stops: Minimum 0.0359-inch- (0.9-mm-) thick steel or 0.040-inch- (1-mm-) thick aluminum.

1. Provide non-removable stops on outside of exterior doors and on secure side of interior doors for glass, louvers, and other panels in doors.
2. Provide screw-applied, removable, glazing beads on inside of glass, louvers, and other panels in doors.

### FINISHES, GENERAL

Comply with NAAMM's "Metal Finishes Manual" for recommendations relative to applying and designating finishes.

Comply with SSPC-PA 1, "Paint Application Specification No. 1," for steel sheet finishes.

Apply primers and organic finishes to doors and frames after fabrication.

### GALVANIZED STEEL SHEET FINISHES

1. Galvanizing Repair Paint: High-zinc-dust-content paint for regalvanizing welds in galvanized steel, with dry film containing not less than 94 percent zinc dust by weight, and complying with DOD-P-21035 or SSPC- Paint 20.

Factory Priming for Field-Painted Finish: Where field painting after installation is indicated, apply air-dried primer specified below immediately after cleaning and pretreatment.

1. Shop Primer: Zinc-dust, zinc-oxide primer paint complying with performance requirements of FS TT-P-641, Type II.

### STEEL SHEET FINISHES

Surface Preparation: Solvent-clean surfaces to comply with SSPC-SP 1 to remove dirt, oil, grease, and other contaminants that could impair paint bond. Remove mill scale and rust, if present, from uncoated steel to comply with SSPC-SP 5 (White Metal Blast Cleaning) or SSPC-SP 8 (Pickling).

Pretreatment: Immediately after surface preparation, apply a conversion coating of type

suited to organic coating applied over it.

Factory Priming for Field-Painted Finish: Apply shop primer that complies with ANSI A224.1 acceptance criteria, is compatible with finish paint systems indicated, and has capability to provide a sound foundation for field-applied topcoats. Apply primer immediately after surface preparation and pretreatment.

## PART 3 – EXECUTION

### INSTALLATION

General: Install steel doors, frames, and accessories according to Shop Drawings, manufacturer's data, and as specified.

Placing Frames: Comply with provisions of SDI 105, unless otherwise indicated. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is completed, remove temporary braces and spreaders, leaving surfaces smooth and undamaged.

1. Except for frames located in existing concrete, masonry, or gypsum board assembly construction, place frames before constructing enclosing walls and ceilings.
2. In masonry construction, install at least 3 wall anchors per jamb adjacent to hinge location on hinge jamb and at corresponding heights on strike jamb. Acceptable anchors include masonry wire anchors and masonry T-shaped anchors.
3. At existing concrete or masonry construction, install at least 3 completed opening anchors per jamb adjacent to hinge location on hinge jamb and at corresponding heights on strike jamb. Set frames and secure to adjacent construction with bolts and masonry anchorage devices.
4. Install fire-rated frames according to NFPA 80.

Door Installation: Fit hollow-metal doors accurately in frames, within clearances specified in ANSI/SDI 100.

1. Fire-Rated Doors: Install with clearances specified in NFPA 80.
2. Smoke-Control Doors: Comply with NFPA 105.

### ADJUSTING AND CLEANING

Prime Coat Touchup: Immediately after erection, sand smooth any rusted or damaged areas of prime coat and apply touchup of compatible air-drying primer.

Protection Removal: Immediately before final inspection, remove protective wrappings from doors and frames.

END OF SECTION 08100

## SECTION 08211 - WOOD DOORS

### PART 1 – GENERAL

#### RELATED DOCUMENTS:

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

#### SUMMARY

This Section includes the following:

1. Solid core doors with wood veneer faces.
2. Factory finishing of flush wood doors.
3. Louvers for flush wood doors.

#### SUBMITTALS

General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.

Product data for each type of door, including details of core and edge construction, trim for openings and louvers, and factory-finishing specifications.

Shop drawings indicating location and size of each door, elevation of each kind of door, details of construction, location and extent of hardware blocking, fire ratings, requirements for veneer matching and factory finishing and other pertinent data.

1. For factory-machined doors, indicate dimensions and locations of cutouts for locksets and other cutouts adjacent to light and louver openings.

Samples for initial selection in the form of color charts consisting of actual materials in small sections for the following:

1. Faces of factory-finished doors with transparent finish. Show the full range of colors available for stained finishes.
2. Faces of factory-finished doors with opaque finish. Show the full range of colors available.

Samples for verification in the form and size indicated below:

1. Corner sections of doors approximately 12 inches (300 mm) square with door faces and edgings representing the typical range of color and grain for

each species of veneer and solid lumber required. Finish sample with same materials proposed for factory-finished doors.

## QUALITY ASSURANCE

Quality Standard: Comply with the following standard:

1. NWWDA Quality Standard: I.S.1-A, "Architectural Wood Flush Doors," of the National Wood Window and Door Association.
2. AWI Quality Standard: "Architectural Woodwork Quality Standards" of the Architectural Woodwork Institute for grade of door, core, construction, finish, and other requirements.

Fire-Rated Wood Doors: Provide wood doors that comply with NFPA 80; are identical in materials and construction to units tested in door and frame assemblies per ASTM E 152; and are labeled and listed by UL, Warnock Hersey, or another testing and inspection agency acceptable to authorities having jurisdiction.

1. Oversized Fire-Rated Wood Doors: For door assemblies exceeding sizes of tested assemblies, provide manufacturer's certificate stating that doors conform to all standard construction requirements of tested and labeled fire-door assemblies except for size.
2. Temperature Rise Rating: At stairwell enclosures, provide doors that have a temperature rise rating of 450 deg F (250 deg C) maximum in 30 minutes of fire exposure.
3. Temperature Rise Rating: At stairwell enclosures, provide doors that have a temperature rise rating of 250 deg F (139 deg C) maximum in 30 minutes of fire exposure.

Single-Source Responsibility: Obtain doors from one source and by a single manufacturer.

## DELIVERY, STORAGE, AND HANDLING

Protect doors during transit, storage, and handling to prevent damage, soiling, and deterioration. Comply with requirements of referenced standard and manufacturer's instructions.

1. Comply with Technical Bulletin 420-R for delivery, storage, and handling of doors.

Identify each door with individual opening numbers as designated on shop drawings, using temporary, removable, or concealed markings.



## PROJECT CONDITIONS

Conditioning: Do not deliver or install doors until building is enclosed, wet work is complete, and HVAC system is operating and will maintain temperature and relative humidity at occupancy levels during the remainder of the construction period.

## WARRANTY

General Warranty: Door manufacturer's warranty specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.

Door Manufacturer's Warranty: Submit written agreement on door manufacturer's standard form signed by manufacturer, Installer, and Contractor, agreeing to repair or replace defective doors that have warped (bow, cup, or twist) more than 1/4 inch (6.35 mm) in a 42-by-84-inch (1067-by-2134-mm) section or that show telegraphing of core construction in face veneers exceeding 0.01 inch in a 3-inch (0.25 mm in a 75-mm) span, or do not conform to tolerance limitations of referenced quality standards.

1. Warranty shall also include installation and finishing that may be required due to repair or replacement of defective doors where defect was not apparent prior to hanging.
2. Warranty shall be in effect during the following period of time after date of Substantial Completion.
  - a. Solid Core Interior Doors: Life of installation.

## PART 1 – PRODUCTS

### MANUFACTURERS

Available Manufacturers: Subject to compliance with requirements, manufacturers offering doors that may be incorporated in the Work (No other Manufacturer to be used unless prior approved by addenda)

Manufacturer: Subject to compliance with requirements, provide doors by one of the following: (No other manufacturers accepted unless prior approved by addenda)

1. Eggers Industries
2. Chappell Door Company
3. Haley Brothers, Inc.

## INTERIOR FLUSH WOOD DOORS

Solid Core Doors for Transparent Finish: Comply with the following requirements:

1. Faces: Plain Sliced White Birch, Book/Run Matching
2. Grade: Premium "A"
3. Construction: 5 ply, Hot Pressed
4. Core: Particleboard Core to meet or exceed ANSI/A208.1 for 1-LD-1 or 1-LD-2 door core
5. Bonding: Stiles and rails bonded to core, then entire unit abrasive planed before veneering.
6. Pair Matching: Required at all pairs of doors.

Fire-Rated Solid Core Doors: Comply with the following requirements:

1. Faces and Grade: Provide faces and grade to match non-fire-rated doors in same area of building, unless otherwise indicated.
2. Construction: Manufacturer's standard core construction as required to provide fire-resistance rating indicated.
3. Edge Construction: Provide manufacturer's standard laminated-edge construction for improved screw-holding capability and split resistance compatible hardwood
4. Pairs: Furnish formed-steel edges and astragals for pairs of fire-rated doors, unless otherwise indicated.
5. Pairs: Provide fire-rated pairs with fire-retardant stiles that are labeled and listed for kinds of applications indicated without formed-steel edges and astragals.

## FABRICATION

Fabricate flush wood doors to comply with following requirements:

1. In sizes indicated for job-site fitting.
2. Factory fit doors to suit frame-opening sizes indicated, with the following uniform clearances and bevels:
  - a. Comply with clearance requirements of referenced quality standard for fitting. Comply with requirements of NFPA 80 for fire-resistance-rated doors.
3. Factory machine doors for hardware that is not surface applied. Locate hardware to comply with DHI-WDHS-3. Comply with final hardware schedules, door frame shop drawings, DHI A115-W series standards, and hardware templates.
  - a. Coordinate measurements of hardware mortises in metal frames to verify dimensions and alignment before proceeding with factory machining.

- b. Metal Astragals: Pre-machine astragals and formed-steel edges for hardware for pairs of fire-rated doors.

Openings: Cut and trim openings through doors to comply with applicable requirements of referenced standards for kind(s) of door(s) required.

1. Light Openings: Trim openings with moldings of material and profile indicated.
2. Louvers: Factory install louvers in prepared openings.

## SHOP PRIMING

Transparent Finish: Shop-seal faces and edges of doors for transparent finish with stain (if required), other required pretreatments, and first coat of finish as specified.

## FACTORY FINISHING

General: Comply with referenced quality standard's requirements for factory finishing.

Finish wood doors at factory.

Transparent Finish: Comply with requirements indicated for grade, finish system, staining effect, and sheen.

1. Grade: Premium.
2. Finish: AWI System TR-6 or better in Factory standard color as directed by the Architect.

## PART 2 – EXECUTION

### EXAMINATION

Examine installed door frames prior to hanging door:

1. Verify that frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with plumb jambs and level heads.
2. Reject doors with defects.

Do not proceed with installation until unsatisfactory conditions have been corrected.

### INSTALLATION

Hardware: For installation see Division 8 Section "Door Hardware."

Manufacturer's Instructions: Install wood doors to comply with manufacturer's instructions and referenced quality standard and as indicated.

1. Install fire-rated doors in corresponding fire-rated frames according to requirements of NFPA 80.

Job-Fit Doors: Align and fit doors in frames with uniform clearances and bevels as indicated below; do not trim stiles and rails in excess of limits set by manufacturer or permitted with fire-rated doors. Machine doors for hardware. Seal cut surfaces after fitting and machining.

1. Fitting Clearances for Non-Fire-Rated Doors: Provide 1/8 inch (3.2 mm) at jambs and heads, 1/16 inch (1.6 mm) per leaf at meeting stiles for pairs of doors, and 1/8 inch (3.2 mm) from bottom of door to top of decorative floor finish or covering. Where threshold is shown or scheduled, provide 1/4-inch (6.4-mm) clearance from bottom of door to top of threshold.
2. Fitting Clearances for Fire-Rated Doors: Comply with NFPA 80.
3. Bevel non-fire-rated doors 1/8 inch in 2 inches (3-1/2 degrees) at lock and hinge edges.
4. Bevel fire-rated doors 1/8 inch in 2 inches (3-1/2 degrees) on lock edge; trim stiles and rails only to extent permitted by labeling agency.

Factory-Fitted Doors: Align in frames for uniform clearance at each edge.

Factory-Finished Doors: Restore finish after installation, if fitting or machining is required at the job site.

## ADJUSTING AND PROTECTION

Operation: Re-hang or replace doors that do not swing or operate freely.

Finished Doors: Refinish or replace doors damaged during installation.

Protect doors as recommended by door manufacturer to ensure that wood doors will be without damage or deterioration at the time of Substantial Completion.

END OF SECTION 08211

## SECTION 08521 - ALUMINUM WINDOWS

### PART 1 - GENERAL

#### RELATED DOCUMENTS

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

#### DESCRIPTION OF WORK

Extent of each type of aluminum window units including window column covers, panning trim, as shown on drawings.

#### QUALITY ASSURANCE

Standards: Except as otherwise indicated requirements for aluminum windows, terminology and standards of performance, and fabrication workmanship are those specified and recommended in ANSI/AAMA 506 and applicable general recommendations published by AAMA and AA. Where more stringent requirements are shown, manufacturer shall provide proof of compliance as required by the architect.

#### Performance and Testing:

General: Except as otherwise indicated, comply with air infiltration tests, water resistance tests, and applicable load tests specified in ANSI/AAMA 506 for type and classification of window units required in each case.

Prior Approval: Window manufacturers other than those specified requesting approval shall submit samples and test data ten days prior to bid opening for approval. Architect will list those approved manufacturers by addendum. No verbal approvals will be issued.

#### SUBMITTALS

Product Data: Submit manufacturer's specifications, recommendations, and standard details for aluminum window units, including certified test laboratory reports as necessary to show compliance with requirements.

Shop Drawings: Submit shop drawings, including wall elevations at 1/4" scale, typical unit elevations at 3/4" scale and full size detail sections of every typical composite member. Show anchors, hardware, operators and other components not included in manufacturer's standard data. Include glazing details.

1. Architect reserves right to require additional samples which will show fabrication techniques, workmanship of component parts, and design of hardware and other exposed auxiliary items.

### SPECIAL PROJECT WARRANTY

Submit written warranty signed by manufacturer, installer and contractor, agreeing to replace aluminum window units which fail in materials or workmanship within 3 years of date of acceptance. Failure of materials or workmanship shall include (but not be limited to) excessive leakage or air infiltration, excessive deflections, faulty operation of sash, deterioration of finish or metal in excess of normal weathering, and defects in hardware, weather-stripping and other components of work.

## PART 2 - PRODUCTS

### MATERIALS

Aluminum Extrusions: Alloy and temper recommended by window manufacturer for strength, corrosion resistance, and application of required finish, but not less than 22,000 psi ultimate tensile strength and not less than 0.062" thickness at any location for main frame and sash members. Comply with ASTM B 221.

Fasteners: Aluminum, non-magnetic stainless steel, or other materials warranted by manufacturer to be noncorrosive and compatible with aluminum window members, trim, hardware, anchors and other components of window units.

1. Reinforcement: Where fasteners screw-anchor into aluminum less than 0.125" thick, reinforce interior with aluminum or non-magnetic stainless steel to receive screw threads, or provide standard non-corrosive pressed in splined grommet nuts.
2. Do not use exposed fasteners except where unavoidable for application of hardware. Match finish of adjoining metal.
3. Provide Phillips flat-head machine screws for exposed fasteners.

Anchors, Clips and Window Accessories: Depending on strength and corrosion-inhibiting requirements, fabricate units of aluminum, non-magnetic stainless steel, or hot-dip zinc coated steel or iron complying with ASTM A 386.

Sealant: Unless otherwise indicated for sealants required within fabricated window units, provide type recommended by window manufacturer for joint size and movement, to remain permanently elastic, non-shrinking and non-migrating. Comply with Division 7 sections for installation of sealants.

GENERAL: All aluminum prime windows shall be single hung type and shall conform to the Architectural Aluminum Manufacturer's Association specification requirements for DH-C-70.

All windows shall be of the type and size shown on the drawings. The following are approved manufacturers:

Traco – Series TR-9100  
Peerless - Series 4130-R  
Georgia Palm Beach - Series 3500

MATERIALS: All sections of frame and sash members shall be of commercial quality extruded 6063-T5 aluminum alloy. Frame shall have a minimum depth of 3-1/4" with a minimum wall thickness of not less than .062". Sill members and panning trim minimum thickness shall not be less than .078". All horizontal ventilator rails shall be of tubular construction and shall have a minimum glazing depth of 7/8". Snap trim, where required, shall be of extruded aluminum of not less than .078" thick. Window to have individual mulls exposed at exterior.

CONSTRUCTION: Frame and sash member joints shall be neatly and securely fastened by means of 2 screws per corner which fasten into screw bosses extruded integrally in the section. Frame corners shall be sealed with an approved sealant in order to provide a permanently leakproof joint. Sash shall have nylon guides to prevent metal to metal contact between sash and frame members.

HARDWARE: Each window shall have a set of heavy duty emergency sill latches. Latch shall be secure lock when windows are in the closed and locked position. Bottom sash shall have a pair of 1/2" heavy block & tackle balances, easily replaceable and adjustable.

WEATHERSTRIPPING: The sash shall have integral grooves containing a silicone treated wool pile with fin seal vinyl barrier. Each sash shall be weather-stripped around the perimeter and double weather-stripped at the jambs.

GLASS AND GLAZING: Provide factory glazed insulated glazing construction (1/4", 1/2", 1/4") as indicated on the drawings, with exterior pane to be tempered Low E - 1/4" Gray tinted on surface #2, 1/2" airspace, and inboard lite to be tempered 1/4" clear. **Equal to 1" Cardinal 366 Gray Lo-E, 35% Visible Trans, 10% Visible Reflect (Out), SHGC 0.25, U value 0.29.** Glass shall be back bedded with an approved bedding compound and held securely in place with an

extruded aluminum snap in glazing bead for easy replacement of broken glass. Wrap around or marine type glazing will not be permitted. Muntins shall be between the glass.

FINISH: Windows shall receive a baked on paint finish to meet AAMA 603.8. Color to be selected from manufactures standards.

### PART 3 - EXECUTION

Comply with manufacturer's specifications and recommendations for installation of window units, hardware, operators, and other components of work.

Set units plumb, level and true to line, without warp or rack of frames or sash. Anchor securely in place. Separate aluminum and other corrodible surfaces from sources of corrosion or electrolytic action.

Set sill members and other members in bed of compound as shown, or with joint fillers or gaskets as shown, to provide weathertight construction. Refer to Division 7 sealant sections for compounds, fillers and gaskets to be installed with window units. Coordinate installation with wall flashings and other components of work.

### ADJUST AND CLEAN

Adjust operating sash and hardware to provide tight fit at contact points and at weather-stripping, for smooth operation and weathertight closure.

Clean aluminum surfaces promptly after installation of windows, exercising care to avoid damage to protective coatings and finishes. Remove excess glazing and sealant compounds, dirt and other substances. Lubricate hardware and moving parts.

Initiate and maintain all protection and other precautions required to ensure that window units will be without damage or deterioration (other than normal weathering) at time of acceptance.

END OF SECTION 08521



## SECTION 08700 – FINISH HARDWARE

### PART 1 – GENERAL

#### RELATED DOCUMENTS

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

#### SUMMARY

This Section includes items known commercially as finish or door hardware that are required for swing, sliding, and folding doors, except special types of unique hardware specified in the same sections as the doors and door frames on which they are installed.

This Section includes the following:

1. Hinges.
2. Pivots.
3. Spring hinges.
4. Key control system.
5. Lock cylinders and keys.
6. Lock and latch sets.
7. Bolts.
8. Exit devices.
9. Push/pull units.
10. Closers.
11. Overhead holders.
12. Miscellaneous door control devices.
13. Door trim units.
14. Protection plates.
15. Weather-stripping for exterior doors.
16. Sound stripping for interior doors.
17. Automatic drop seals (door bottoms).
18. Astragals or meeting seals on pairs of doors.
19. Thresholds.

Related Sections: The following Sections contain requirements that relate to this Section:

1. Division 8 Section "Standard Steel Doors and Frames" for silencers integral with hollow metal frames.
2. Division 8 Section "Flush Wood Doors" for factory pre-fitting and factory pre-machining of doors for door hardware.

3. Division 8 Section "Aluminum Entrances and Storefronts" for aluminum entrance door hardware, except cylinders.

Door hardware supplier's responsibilities shall be as follows:

1. Submittals: Submit through Contractor required product data, final hardware schedule; separate keying schedule, and samples as specified in this Section, unless otherwise indicated.
2. **Hardware Review Meeting**: **Hardware Supplier shall attend a scheduled "Hardware Review Meeting" with the Contractor, Owner and Architect representative. All Hardware products, hardware installation locations, finishes, color selections, ratings and keying is to be reviewed and discussed. The Hardware Supplier understands the Hardware Submittal is not deemed "Fully Approved" until the Owner has completed their review and given "Approval".**
3. Construction Schedule: Inform Contractor promptly of estimated times and dates that will be required to process submittals, to furnish templates, to deliver hardware, and to perform other work associated with furnishing door hardware for purposes of including this data in construction schedule. Comply with this schedule.
4. Coordination and Templates: Assist Contractor as required to coordinate hardware with other work in respect to both fabrication and installation. Furnish Contractor with templates and deliver hardware to proper locations.
5. Product Handling: Package, identify, deliver, and inventory door hardware specified in this Section.
6. Discrepancies: Based on requirements indicated in Contract Documents in effect at time of door hardware selection, furnish types, finishes, and quantities of door hardware, including fasteners, and Owner's maintenance tools required to comply with specified requirements and as needed to install and maintain hardware. Furnish or replace any items of door hardware resulting from shortages and incorrect items at no cost to the Owner or Contractor. Obtain signed receipts from Contractor for all delivered materials.

Contractor's responsibilities shall be as follows:

1. Submittals: Coordinate and process submittals for door hardware in same manner as submittals for other work.
2. **Hardware Review Meeting**: **Contractor is to schedule and attend a "Hardware Review Meeting" with the Owner, Hardware Supplier and Architect Representative. All Hardware products, hardware installation locations, finishes, color selections, ratings and keying is to be reviewed and discussed. The Contractor understands the Hardware Submittal is not deemed "Fully Approved" until the Owner**

**has completed their review and given “Approval”.**

3. Construction Schedule: Cooperate with door hardware supplier in establishing scheduled dates for submittals and delivery of templates and door hardware. Incorporate in construction schedule the times and dates related to furnishing hardware by door hardware supplier.
4. Coordination: Coordinate door hardware with other Work. Furnish hardware supplier or manufacturer with shop drawings of other work where required or requested. Verify completeness and suitability of hardware with supplier.
5. Product Handling: Provide secure lock-up for hardware delivered to the site. Inventory hardware jointly with representative of hardware supplier and issue signed receipts for all delivered materials.
6. Installation Information: The general types and approximate quantities of hardware required for this Project are indicated at the end of this Section in order to establish Contractor's costs for installation and other work not included in allowance.
7. No adjustments in Contract sum will be made for costs other than those covered by the allowances for subsequent increases or decreases in quantity of one or more hardware types that do not exceed 5 percent.

## SUBMITTALS

General: Submit the following in accordance with Conditions of Contract and Division 1 Specification sections.

Product data including manufacturers' technical product data for each item of door hardware, installation instructions, maintenance of operating parts and finish, and other information necessary to show compliance with requirements.

Final hardware schedule coordinated with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.

1. Upon return of the reviewed finish hardware schedule, arrange for a meeting with the Owner and representatives of Architect. A keying schedule will be established and submitted to the Architect and Owner. After review, the keying schedule will be returned to representatives of Finish Hardware Supplier so that permanent cylinders and keys can be prepared on a timely basis.

## QUALITY ASSURANCE

Single Source Responsibility: Obtain each type of hardware (latch and lock sets, hinges, closers, etc.) from a single manufacturer.

Supplier Qualifications: A recognized architectural door hardware supplier, with

warehousing facilities in the Project's vicinity, that has a record of successful in-service performance for a minimum of 10 years, for supplying door hardware similar in quantity, type, and quality to that indicated for this Project and that employs an experienced "Certified" architectural hardware consultant (AHC) "with Door and hardware Institute (DHI)" all submittals will require a current certification seal of AHC "who is available to Owner, Architect, and Contractor, at reasonable times during the course of the Work, for consultation.

Fire-Rated Openings: Provide door hardware for fire-rated openings that complies with NFPA Standard No. 80 and requirements of authorities having jurisdiction. Provide only items of door hardware that are listed and are identical to products tested by UL, Warnock Hersey, FM, or other testing and inspecting organization acceptable to authorities having jurisdiction for use on types and sizes of doors indicated in compliance with requirements of fire-rated door and door frame labels.

### PRODUCT HANDLING

Tag each item or package separately with identification related to final hardware schedule, and include basic installation instructions with each item or package.

Packaging of door hardware is responsibility of supplier. As material is received by hardware supplier from various manufacturers, sort and repackage in containers clearly marked with appropriate hardware set number to match set numbers of approved hardware schedule. Two or more identical sets may be packed in same container.

Inventory door hardware jointly with representatives of hardware supplier and hardware installer until each is satisfied that count is correct.

Deliver individually packaged door hardware items promptly to place of installation (shop or Project site).

Provide secure lock-up for door hardware delivered to the Project, but not yet installed. Control handling and installation of hardware items that are not immediately replaceable so that completion of the Work will not be delayed by hardware losses both before and after installation.

### MAINTENANCE

Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

## PART 2 – PRODUCTS

## ACCEPTABLE MANUFACTURERS

### Hinges & Pivots:

Ives  
Hager  
Stanley  
Bommer

1. Provide only template produced units
2. Provide Phillips flat-head or machine screws for installation of units, except furnish Phillips flat-head wood screws for installation of units in to wood. Finish screw heads to match surface of hinges or pivots.
3. Hinge pins, except as noted, are to be provided as follows:
  - a. Steel Hinges: Steel pins
  - b. Non-ferrous Hinges: Stainless steel pins
  - c. Exterior Doors: Use Non Removable Pins
  - d. Interior Doors: Non-rising pins
  - e. Electric Hinges: Non-removable pins
4. Tips shall be flat button and matching plug, finished to match leaves.
5. Provide number of hinges indicated but not less than three (3) hinges for door leaf of 90" or less in height and one additional hinge for each 30" of additional height.
6. Provide ball bearing hinges of the type and weight suggested by the hinge manufacturer for each type of door application.

### Lock Cylinders & Keying:

Master key all lock cylinders to the owner's existing system. Provide a master keyed cylinder for all locks and exit devices. Cylinders shall be standard 6-pin or interchangeable key removable core – type as required to match existing. Match existing keyways. All locks and cylinders to be keyed as directed by owner.

Provide construction master keying or temporary cylinders for locks as required.

#### Key Quantities:

4 each operating keys per keyed core.

5 each master keys.

50 each key blanks.

10 each construction master keys.

### Locksets & Latch-sets:

Falcon MA Series, "DG" design  
Schlage L series, "06A" design\*

Sargent 8200 Series, "LN" design  
(No other manufacturer to be accepted)

1. Locksets and latch-sets of all manufacturers must conform to the requirements of Subparagraphs 2 and, and be approved by the Architect.
  - a. Locks and latches shall be warrantied for a minimum of one year from date of shipment.

Exit Devices:

Von Duprin - 98 Series  
Precision Apex Series  
(No other manufacturer to be accepted)

1. All exit devices to be of one manufacturer and provided in same finish and lever design as Locksets.
2. Provide sex nuts and bolts for attachment of surface applied items to doors.
3. Devices shall be UL listed. Devices for fire rated openings shall bear factory installed UL markings that indicate approval for fire rated openings.
4. All exit devices shall be touch-bar type design and Grooved aluminum extrusions are not allowed.
5. All exit devices shall comply with ANSI A156.3, Grade 1.
6. Exit device trim shall be as specified in the door hardware sets.
7. Exit devices shall be warrantied for a minimum of three years from date of shipment.

Closers:

Sargent 281 Series  
LCN 4040XP Series\*  
Norton 7500 Series  
(No other manufacturer to be accepted)

1. Size of units: Except as otherwise specifically indicated, comply with the manufacturer's recommendations for size of door control unit, depending upon size of door, exposure to weather and anticipated frequency of use.
  - a. Where parallel arms are indicated for closers, provide closer unit one size larger than recommended for use with standard arms.
  - b. Where manual closers are indicated for doors required to be accessible to the physically handicapped, provide adjustable units, ANSI opening force and delayed action closing.
2. Provide manual closers that are certified ANSI grade 1 and are UL listed for fire door use. Provide with minimum 10 year manufacturer's warranty. Closers are to be fully hydraulic, rack and pinion action with high strength cast iron cylinders and one piece forged steel pistons. Hydraulic fluid

to be of a type requiring no seasonal adjustments for temperature. Hydraulic regulation to be controlled by tamper-proof, non-critical screw valves, adjustable with a hex by tamper-proof, non-critical screw valves, adjustable with a hex wrench. Separate adjustments for back check, general speed, and latch speed. Where detailed on double lever arm closers, provide a delayed action feature to delay closing up to one minute for maximum opening to approximately 75. Back check shall be properly located for protection of the door, frame and applied hardware.

3. Use of closers with built-in spring or cushion stops will be allowed in lieu of overhead stops.
4. All door closers shall comply with ANSI A156.4 Grade 1 and meet the standards of ANSI A117.1 for barrier-free accessibility.

#### Overhead Stops and Holders:

Glynn Johnson  
Sargent  
Corbin Russwin  
(No other manufacturer to be accepted)  
1. Conform to ANSI A156.8 Grade 1.

#### Push/Pulls, Protection Plates:

Ives  
Hager  
Rockwood  
Burns  
(No other manufacturer to be accepted)  
  
1. Provide manufacturers standard exposed fasteners for installation, through bolted for matched pairs, but not of single units.  
2. Provide 16 gauge minimum thickness for plates.  
3. Where specified in the schedule, push/pulls shall have an antimicrobial coating.

#### Threshold, Weather-stripping & Gasketing:

Zero  
Hager  
National Guard  
(No other manufacturer to be accepted)

1. Provide continuous weather-stripping at each edge of every exterior door

- leaf, except as otherwise indicated.
2. Provide type, size and profile shown as scheduled.
3. Provide non-corrosive fasteners as recommended by manufacturer for application indicated. Do not specify adhesive backed weather-strip or gasket material.
4. Where replaceable seal strips are scheduled, provide only those units where resilient or flexible seal strip is easily replaceable from stocks maintained by manufacturer.
5. Proved standard metal threshold unit of type, size and profile shown as scheduled.

## FINISHES

Hardware finishes conforming to ANSI standards shall be as follows for hollow metal doors, wood doors and aluminum entrance doors:

Continuous Gear Hinges:	Dark bronze anodized aluminum
Butt Hinges:	Exterior 630, Interior 652
Locks:	626, Satin Chrome
Cylinders	626
Surface Closers:	689
Exit Devices:	US26D, with Stainless Steel Touch bars.
Overhead Stops/Holders	630
Flatgoods:	630
Thresholds:	628
Adhesive Gasket Seals	Dark Bronze, Black or Dark Gray
Miscellaneous Items:	626 or 630

## PART 3 – EXECUTION

### INSTALLATION

Install each hardware item in compliance with manufacturer's instructions and recommendations. Where cutting and fitting is required to install hardware onto or into surfaces that are later to be painted or finished in another way, install each item completely and then remove and store in a secure place during the finish application. After completion of the finishes, reinstall each item.

1. Do not install surface mounted items until finishes have been completed on the substrate.

Conform to ANSI A117.1 for positioning requirements for the handicapped.



## PROTECTION & CLEANING

After installation, clean metal surfaces on both interior and exterior of all mortar, paint and other contaminants. After cleaning, protect work against damage.

## FINAL ADJUSTMENT

Whenever hardware is installed more than one month prior to occupancy or acceptance, return during the week prior to acceptance or occupancy and make a final inspection and adjustment of all hardware items in such space or area.

## SCHEDULE

HWSET: 001

DOOR NUMBER:

100                      100a

EACH TO HAVE:

2	CONT. HINGE	224XY EPT	IVE
2	POWER TRANSFER	EPT10	VON
1	ELEC PANIC HARDWARE	QEL-9849-DT-697DT (CONCEAL CABLE)	VON
1	ELEC PANIC HARDWARE	QEL-9849-NL-697NL (CONCEAL CABLE)	VON
1	RIM CYLINDER	TYPE AS REQUIRED	SCH
1	MORTISE CYLINDER	TYPE AS REQUIRED	SCH
2	SURFACE CLOSER	4040XP SCUSH TBSRT	LCN
2	KICK PLATE	8400 10" X 1" LDW B-CS	IVE
1	PERIMETER SEAL	8144S-BK	ZER
1	MEETING EDGE SEAL	328AA	ZER
2	DOOR SWEEP	8192AA	ZER
1	THRESHOLD	65A-226	ZER
1	EXIT POWER SUPPLY	PS902 900-4RL	SCE
1	CARD READER	PROVIDED BY OTHERS	
1	ELECTRICAL DIAGRAM	RISER FOR ILLUSTRATION CONDUIT REQUIRED AT DOOR FRAME	

COORDINATE HARDWARE WITH ELECTRICAL DRAWINGS AND ACCESS CONTROL SYSTEMS.  
ELECTRIFIED PANIC DEVICE TO BE CONTROLLED BY CARD READER AND ACCESS CONTROL  
SYSTEM SOFTWARE.

ELECTRIC EXIT DEVICES AT DOORS 100 AND 100A MAY SHARE POWER SUPPLY THE ABOVE  
POWER SUPPLY.

HWSET: 002

DOOR NUMBER:

108

EACH TO HAVE:

3	HINGE	5BB1 4.5 X 4.5	IVE
1	OFFICE LOCK	L9050 L583-363	SCH
1	WALL STOP	WS406/407CVX	IVE
18-144	FINISH HARDWARE		08700-9

HWSET: 003

DOOR NUMBER:

101

EACH TO HAVE:

3	HINGE	5BB1 4.5 X 4.5 NRP	IVE
1	EXIT DEVICE	98-L-NL-F	VON
1	RIM CYLINDER	TYPE AS REQUIRED	SCH
1	SURFACE CLOSER	4040XP CUSH TBSRT	LCN
1	MOP PLATE	8400 6" X 1" LDW B-CS (PULL SIDE)	IVE

HWSET: 004

DOOR NUMBER:

105

105a

EACH TO HAVE:

3	HINGE	5BB1HW 4.5 X 4.5 NRP	IVE
1	EXIT DEVICE	98-L-F	VON
1	CYLINDER	TYPE AS REQUIRED	SCH
1	SURFACE CLOSER	4040XP EDA TBSRT	LCN
1	KICK PLATE	8400 8" X 1 1/2" LDW B-CS	IVE
1	MOP PLATE	8400 6" X 1" LDW B-CS	IVE
1	WALL STOP	WS406/407CVX	IVE

HWSET: 005

DOOR NUMBER:

111

EACH TO HAVE:

2	CONT. HINGE	224XY	IVE
1	EXIT DEVICE	9827-EO-F-LBR-SNB	VON
1	EXIT DEVICE	9827-L-F-LBR-SNB	VON
1	RIM CYLINDER	TYPE AS REQUIRED	SCH
2	SURFACE CLOSER	4040XP SCUSH TBSRT	LCN
2	ARMOR PLATE	8400 34" X 1" LDW B-CS	IVE
2	MOP PLATE	8400 6" X 1" LDW B-CS	IVE
2	CONCEALED AUTO DBTM	364AA	ZER
1	MEETING EDGE SEAL	328AA	ZER
1	PERIMETER SEAL	8144S-BK	ZER

HWSET: 006

DOOR NUMBER:

103 110

EACH TO HAVE:

3	HINGE	5BB1 4.5 X 4.5	IVE
1	CLASSROOM LOCK	L9070	SCH
1	MOP PLATE	8400 6" X 1" LDW B-CS	IVE
1	MOP PLATE	8400 6" X 2" LDW B-CS	IVE
1	WALL STOP	WS406/407CVX	IVE

HWSET: 007

DOOR NUMBER:

102 104

EACH TO HAVE:

3	HINGE	5BB1 4.5 X 4.5 NRP	IVE
1	STOREROOM LOCK	L9080	SCH
1	SURFACE CLOSER	4040XP SCUSH TBSRT	LCN
1	KICK PLATE	8400 8" X 1 1/2" LDW B-CS	IVE
1	MOP PLATE	8400 6" X 1" LDW B-CS	IVE

HWSET: 008

DOOR NUMBER:

109

EACH TO HAVE:

3	HINGE	5BB1 4.5 X 4.5	IVE
1	PASSAGE SET	L9010	SCH
1	WALL STOP	WS406/407CVX	IVE

HWSET: 009

DOOR NUMBER:

106 107

EACH TO HAVE:

1	CONT. HINGE	224XY	IVE
1	PULL/PULL LATCH	HL6-3-A-B-E1-630AM	IVE
1	SURFACE CLOSER	4040XP EDA TBSRT	LCN
1	KICK PLATE	8400 8" X 1 1/2" LDW B-CS	IVE
1	MOP PLATE	8400 6" X 1" LDW B-CS	IVE
1	WALL STOP	WS406/407CVX	IVE

END OF SECTION 08700

18-144

FINISH HARDWARE

08700-11

## SECTION 08800 - GLASS AND GLAZING

### PART 1 – GENERAL

#### RELATED DOCUMENTS:

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

#### DESCRIPTION OF WORK:

Definitions: "Glass" includes both primary and fabricated glass products as described in FGMA "Glazing Manual". "Glazing" includes glass installation and materials used to install glass.

Extent of glass and glazing work is indicated on drawings and schedules.

Types of work in this section include glass and glazing for:

1. Interior and Exterior Doors.

#### SYSTEM PERFORMANCES:

Provide glass and glazing that has been produced, fabricated and installed to withstand normal temperature changes, wind loading, impact loading (where applicable), without failure including loss or breakage of glass, failure of sealants or gaskets to remain watertight and airtight, deterioration of glass and glazing materials and other defects in the work.

#### QUALITY ASSURANCE:

Glazing Standards: Comply with recommendations of Flat Glass Marketing Association (FGMA) "Glazing Manual" and "Sealant Manual" except where more stringent requirements are indicated. Refer to those publications for definitions of glass and glazing terms not otherwise defined in this section or other referenced standards.

Safety Glazing Standard: Where safety glass is indicated or required by authorities having jurisdiction, provide type or products indicated which comply with ANS Z97.1 and testing requirements of 16 CFR Part 1201 for category II materials.

Single Source Responsibility: Provide materials obtained from one source for each type of glass and glazing product indicated.

## SUBMITTALS:

Product Data: Submit manufacturer's technical data for each glazing material and fabricated glass product required, including installation and maintenance instructions.

Samples: Submit for verification purposes, 12" square samples of each type of glass indicated except for clear single pane units, and 12" long samples of each color required (except black) for each type of sealant or gasket exposed to view. Install sealant or gasket sample between two strips of materials representative of adjoining framing system in color.

Certificates: Submit certificates from respective manufacturers attesting that glass and glazing materials furnished for project comply with requirements.

## DELIVERY, STORAGE AND HANDLING:

Protect glass and glazing materials during delivery, storage and handling to comply with manufacturer's directions and as required to prevent edge damage to glass, and damage to glass and glazing materials from effects of moisture including condensation, of temperature changes, of direct exposure to sun, and from other causes.

## PROJECT CONDITIONS:

Environmental Conditions: Do not proceed with glazing when ambient and substrate temperature conditions are outside the limits permitted by glazing material manufacturer or when joint substrates are wet due to rain, frost, condensation or other causes. Install glazing sealants only when temperatures are in middle third of manufacturer's recommended installation temperature range.

## PART 2 – PRODUCTS

Manufacturers: The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:

### Manufacturers of Clear Float Glass:

Advanced Coating Technology, Inc., Franklin, Inc.  
Ford Motor Co., Glass Div., Detroit, Mi.  
Guardian Industries Corp., Carleton, Mi.  
Libbey-Owens-Ford Co.  
PPG Industries, Inc., Atlanta, Ga.

### Manufacturers of Figured/Pattern Glass:

AFG Industries, Inc.  
Guardian Industries Corp.  
Hordis Brothers, Inc.

Manufacturers of Fabricated Glass Products:

Advanced Coating Technology

Ford Motor Co., Glass Div.

Guardian Industries Corp.

Hordis Brothers, Inc.

Libbey-Owens-Ford Co.

PPG Industries, Inc.

Equal products of other manufacturers maybe used in the work, provided such products have been approved by the Architect, not less than five (5) days prior to scheduled bid opening.

GLASS PRODUCTS, GENERAL:

Insulated Glass: Provide insulated glazing construction (1/4", 1/2", 1/4") as indicated on the drawings, with exterior pane to be 1/4" tinted tempered, 1/2" airspace, and interior pane to be 1/4" clear. Where "reflective spandrel" panel is indicated provide 1/4" dark reflective tinted tempered in color as selected by the Architect (ie: reflective coated – outdoor reflectance 35% visible).

Clear Tempered Glass: Provide glazing construction of 1/4" clear tempered, single pane glass.

Primary Glass Standard: Provide primary glass which complete with FS DD-G-451 requirements, including those indicated by reference to type, class, quality and form.

Heat-Treated Glass Standard: Provide heat-treated glass which complies with FS DD-G-1403 requirements, including those indicated by reference to grade, style, type, quality and class.

PRIMARY GLASS PRODUCTS:

Tinted Float Glass: Type I, Class 1 (transparent), quality q3 (glazing select).

HEAT-TREATED GLASS PRODUCTS:

Manufacturing Process: Manufacture heat-treated glass as follows:

1. By horizontal (roller hearth) process with roll wave distortion parallel with bottom edge of glass as installed, unless otherwise indicated.

Clear Tempered Float Glass: Grade B (fully tempered), style I (uncoated surfaces), Type I (float), quality q3 (glazing quality), Class 1 (transparent). 1/4" thick.

Tinted Tempered Float Glass: Grade B (fully tempered), Style I (uncoated surfaces), Type I (float), class 2 (heat absorbing), of tint and with performance characteristics for 1/4" thick glass indicated below:

1. Match tint and performance characteristics specified for tinted float glass.

#### GLAZING SEALANTS:

General: Comply with recommendations of sealant and glass manufacturers for selection of glazing sealants which have performance characteristics suitable for applications indicated and conditions at time of installation.

Compatibility: Select sealants with proven compatibility with surfaces contacted in the installation and under service conditions indicated, as demonstrated by testing and field experience.

Colors: Provide color of exposed sealants indicated or, if not otherwise indicated, as selected by Architect from manufacturer's standard colors.

2-Part Polysulfide Glazing Sealant: Polysulfide elastomeric sealant complying with FS TT-S-00227, Class A, Type 2; and with ASTM C 920, Type M, Grade NS, Class 25, Use G and, as applicable to use indicated, Uses A and O.

Preformed Butyl-Polyisobutylene Glazing Tape: Blend of butyl- polyisobutylene rubber with a solids content of 100%, in extruded tape form, complying with AAMA 807.1, packaged on rolls with a release paper on side, with or without continuous spacer rod as recommended by manufacturers of tapes and glass for application indicated.

Manufacturers: The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:

#### 2-Part Polysulfide Glazing Sealants:

Sonolastic Two-part; Sonneborn Building Products Div.,  
Rexnord Chemical Products, Inc.  
Chem-Calk 100; Woodmont Products, Inc.

#### Preformed Butyl-Polyisobutylene Glazing Tape:

PTI 606; Protective Treatments, Inc.  
PTI 303; Protective Treatments, Inc.  
Tremco Polyshim Tape; Tremco.  
Tremco 440 Tape; Tremco.  
SST 800 Tape; Tremco.

Equal products of other manufacturers may be used in the work, provided such products have been approved by the Architect, not less than five (5) days prior to scheduled bid opening.

## MISCELLANEOUS GLAZING MATERIALS:

Compatibility: Provide materials with proven record of compatibility with surfaces contacted in installation.

Cleaners, Primers and Sealers: Type recommended by sealant or gasket manufacturer.

Setting Blocks: Neoprene, EPDM or silicone blocks as required for compatibility with glazing sealants, 80 to 90 Shore A duro-meter hardness.

Spacers: Neoprene, EPDM or silicone blocks, or continuous extrusions, as required for compatibility with glazing sealant, of size, shape and hardness recommended by glass and sealant manufacturers for application indicated.

Edge Blocks: Neoprene EPDM or silicone blocks as required for compatibility with glazing sealant, of size and hardness required to limit lateral movement (side-walking) of glass.

## PART 3 – EXECUTION

### INSPECTION:

Require Glazier to inspect work of glass framing erector for compliance with manufacturing and installation tolerances, including those for size, squareness, offsets at corners; for presence and functioning of weep system; for existence of minimum required face or edge clearances; and for effective sealing of joinery. Obtain Glazier's written report listing conditions detrimental to performance of glazing work. Do not allow glazing work to proceed until unsatisfactory conditions have been corrected.

### PREPARATION:

Clean glazing channels and other framing members to receive glass, immediately before glazing. Remove coatings which are not firmly bonded to substrates. Remove lacquer from metal surfaces where elastomeric sealants are indicated for use.

### GLAZING, GENERAL:

Comply with combined printed recommendations of glass manufacturers, of manufacturers of sealants, gaskets and other glazing materials, except where more stringent requirements are indicated, including those of referenced glazing standards.

Glazing channel dimensions as indicated in details are intended to provide for necessary bite on glass, minimum edge and face clearances, and adequate sealant thickness' with reasonable tolerances. Adjust as required by job conditions at time of installation.



Protect glass from edge damage during handling and installation; use a rolling block in rotating glass units to prevent damage to glass corners. Do not impact glass with metal framing. Use suction cups to shift glass units within openings; do not raise or drift glass with a pry bar. Rotate glass with flares or bevels along one horizontal edge which would occur in vicinity of setting blocks so that these are located at top of opening.

Remove from project and dispose of glass units with edge damage or other imperfections of kind that, when installed, weakens glass and impairs performance and appearance.

Apply primers to joint surfaces where required for adhesion of sealants, as determined by pre-construction sealant-substrate testing.

#### GLAZING:

Install setting blocks of proper size in sill rabbet, located one quarter of glass width from each corner, but no closer than 6", unless otherwise required. Set blocks in thin course of sealant which is acceptable for heel bead use.

Provide spacers inside and out, of correct size and spacing to preserve required face clearances, for glass sizes larger than 50 unit inches, except where gaskets or glazing tapes with continuous spacer rods are used for glazing. Provide 1/8" minimum bite of spacers on glass and use thickness equal to sealant width, except with sealant tape use thickness slightly less than final compressed thickness of tape.

Provide edge blocking to comply with requirements of referenced glazing standard, except where otherwise required by glass unit manufacturer.

Set units of glass in each series with uniformity of pattern, draw, bow and similar characteristics.

Provide compressible filler rods or equivalent back-up material, as recommended by sealant and glass manufacturers, to prevent sealant from extruding into glass channel weep systems and from adhering to joints back surface as well as to control depth of sealant for optimum performance, unless otherwise indicated.

Force sealants into glazing channels to eliminate voids and to ensure complete "wetting" or bond of sealant to glass and channel surfaces.

Tool exposed surfaces of sealants to provide a substantial "wash" way from glass. Install pressurized tapes and gaskets to protrude slightly out of channel, so as to eliminate dirt and moisture pockets.

Where wedge-shaped gaskets are driven into one side of channel to pressurized sealant or gasket on opposite side, provide adequate anchorage to ensure that gasket will not "walk" out when installation is subjected to movement.

Miter cut wedge-shaped gaskets at corners and install gaskets in manner recommended by gasket manufacturer to prevent pull away at corners; seal corner joints and butt joints with sealant recommended by gasket manufacturer.

#### PROTECTION AND CLEANING:

Protect exterior glass from breakage immediately upon installation by use of crossed streamers attached to framing and held away from glass. Do not apply markers to surfaces of glass. Remove nonpermanent labels and clean surfaces.

Examine glass surface adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less often than once a month, for build-up of dirt, scum, alkali deposits or staining. When examination reveals presence of these forms of residue, remove by method recommended by glass manufacturer.

Remove and replace glass which is broken, chipped, cracked, abraded, or damaged in other ways during construction period including natural causes, accidents and vandalism.

Wash glass on both faces not more than 4 days prior to date schedule for inspection intended to establish date of substantial completion in each area of project. Wash glass by method recommended by glass manufacturer.

END OF SECTION 08800

## SECTION 09250 - GYPSUM DRYWALL

### PART 1 – GENERAL

#### RELATED DOCUMENTS:

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

#### DESCRIPTION OF WORK:

Types of work include:

1. Gypsum drywall at walls and ceilings.
2. Drywall finishing (joint tape-and-compound treatment).

#### QUALITY ASSURANCE:

Fire-Resistance Ratings: Where gypsum drywall systems with fire- resistance ratings are indicated, provide materials and installations which are identical with those of applicable assemblies tested per ASTM E 119 by fire testing laboratories acceptable to authorities having jurisdiction.

1. Provide fire-resistance rated assemblies identical to those indicated by reference to GA File No.'s. in GA "Fire Resistance Design Manual" or to design designations in UL "Fire Resistance Directory" or in listing of other testing and agencies acceptable to authorities having jurisdiction.

Gypsum Board Terminology Standard: GA-505 by Gypsum Association.

Single-Source Responsibility: Obtain gypsum board products from a single manufacturer, or from manufacturers recommended by the prime manufacturer of gypsum boards.

#### SUBMITTALS:

Product Data: Submit manufacturer's product specifications and installation instructions for each gypsum drywall component, including other data as may be required to show compliance with these specifications.

#### DELIVERY, STORAGE AND HANDLING:

Deliver materials in original packages, containers or bundles bearing brand name and identification of manufacturer or supplier.

Store material inside under cover and in manner to keep them dry, protected from weather, direct sunlight, surface contamination, corrosion and damage from construction traffic and other causes. Neatly stack gypsum boards flat to prevent sagging.

Handle gypsum boards to prevent damage to edges, ends or surfaces. Protect metal corner beads and trim from being bent or damaged.

## PROJECT CONDITIONS:

Environmental Requirements, General: Comply with requirements of referenced gypsum board application standards and recommendations of gypsum board manufacturer, for environmental conditions before, during and after application of gypsum board.

Cold Weather Protection: When ambient outdoor temperatures are below 55 degrees F maintain continuous, uniform, comfortable building working temperatures of not less than 55 degrees F for a minimum period of 48 hours prior to, during and following application of gypsum board and joint treatment materials or bonding of adhesives.

Ventilation: Ventilate building spaces as required to remove water in excess of that required for drying of joint treatment material immediately after its application. Avoid drafts during dry, hot weather to prevent too rapid drying.

## PART 2 – PRODUCTS

Manufacturer: The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:

### Gypsum Board and Related Products:

Georgia-Pacific Corp.

Gold Bond Building Products Div., National Gypsum Co.

United States Gypsum Co.

CertainTeed Corporation

Lafarge North America

Equal products of other manufacturers may be used in the work, provided such products have been approved by the Architect, not less than five (5) days prior to scheduled bid opening.

Gypsum Wallboard: ASTM C 36, of types, edge configuration and thickness indicated below; in maximum lengths available to minimize end-to-end butt joints.

Types as follows:

1. Provide Type "X" fire-resistant at all locations unless otherwise where identified by a UL Listing or Classification or as denoted on the drawings.
2. Provide Type "C", fire-resistant where identified by a UL Listing or Classification where denoted on the drawings.
3. Impact/Penetration Resistant Type "X" fire-resistant at locations as identified on the drawings. Equal to Hi-Impact Brand 2000 Fire Shield by National Gypsum. Tested in accordance with ASTM C36/C 1396 Type X, ASTM E 695, ASTM D 1037, ASTM D4977 and ASTM D 4060.
4. Provide Type "MR" moisture resistant, where gypsum board is shown at all wet areas (Restrooms, etc.) install 5/8" moisture resistant gypsum board at all wet walls where plumbing fixtures are shown.
5. Thickness: 5/8" unless otherwise indicated.
6. Edges: Manufacturer's standard.

Air Barrier: (Where indicated and/or identified on the drawings) At the bottom of the wood trusses the Contractor shall furnish and install the following materials:

1. Gypsum board having a thickness of not less than 1/2 inch (12 mm). Seal all joints with insulation tape.

TRIM ACCESSORIES:

General: Provide manufacturer's standard trim accessories of types indicated for drywall work, formed of galvanized steel unless otherwise indicated, with either knurled and perforated or expanded flanges for nailing or stapling, and beaded for concealment of flanges in joint compound. Provide corner beads, L-type edge trim-beads, U-type edge trim-beads, special L-kerf-type edge trim-beads, and one-piece control joint beads.

Non-Beaded Trim: Non-beaded trim shall not be used, except with specific approval by the Architect.

JOINT TREATMENT MATERIALS:

General: ASTM C 475; type recommended by the manufacturer for the application indicated, except as otherwise indicated.

Joint Tape: Paper reinforcing tape.

Joint Compound: Ready-mixed vinyl-type for interior use.

1. Grade: A single multi-purpose grade, for entire application.

## MISCELLANEOUS MATERIALS:

General: Provide auxiliary materials for gypsum drywall work of the type and grade recommended by the manufacturer of the gypsum board.

Gypsum Board Screws: Comply with ASTM C 646.

Gypsum Board Nails: Comply with ASTM C 514.

Concealed Acoustical Sealant: Nondrying, nonhardening, nonskinning, nonstaining, nonbleeding, gunnable sealant for concealed applications per ASTM C 919.

Exposed Acoustical Sealant: Nonoxidizing, skinnable, paintable, gunnable sealant for exposed applications per ASTM C 919.

Water-Resistant Adhesive: Type I organic adhesive for ceramic tile complying with ANSI A136.1.

## PART 3 – EXECUTION

### GENERAL GYPSUM BOARD INSTALLATION REQUIREMENTS:

Gypsum Board Application and Finishing Standards: ASTM C 840 and GA 216.

Locate exposed end-butt joints as far from center of walls possible, and stagger not less than 1'-0" in alternate courses of board.

Install wall/partition boards vertically to avoid end-butt joints wherever possible.

Install exposed gypsum board with face side out. Do not install imperfect, damaged or damp boards. Butt boards together for a light contact at edges and ends with not more than 1/16" open space between boards. Do not force into place.

Locate all edge and end joints over supports. Stagger vertical joints over different studs on opposite sides of partitions.

Attach gypsum board to supplementary framing and blocking provided for additional support at openings and cutouts.

Form control joints and expansion joints with space between edges of boards, prepared to receive trim accessories.

Cover both faces of stud framing with gypsum board in concealed spaces (above ceilings, etc.), except in chase walls which are braced internally.

1. Except where concealed application is required for sound, fire, air or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. area, and may be limited to not less than 75% of full coverage.

Isolate perimeter of non-load-bearing drywall partitions at structural abutments. Provide 1/4" to 1/2" space and trim edge with J-type semi-finishing edge trim. Seal joints with acoustical sealant.

Space fasteners in gypsum boards in accordance with referenced standards and manufacturer's recommendations, except as otherwise indicated.

#### METHODS OF GYPSUM DRYWALL APPLICATION:

Single-Layer Application: Install gypsum wallboard.

1. On partitions/walls apply gypsum board vertically unless otherwise indicated, and provide sheet lengths which will minimize end joints.

#### INSTALLATION OF DRYWALL TRIM ACCESSORIES:

General: Where feasible, use the same fasteners to anchor trim accessory flanges as required to fasten gypsum board to the supports. Otherwise, fasten flanges by nailing or stapling in accordance with manufacturer's instructions and recommendations.

Install metal corner beads at external corners of drywall work.

Install metal edge trim whenever edge of gypsum board would otherwise be exposed or semi-exposed, and except where plastic trim is indicated. Provide type with face flange to receive joint compound except where semi-finishing type is indicated. Install L-type trim where work is tightly abutted to other work, and install special kerf-type where other work is kerfed to receive long leg of L-type trim. Install U-type trim where edge is exposed, revealed, gasketed, or sealant-filled (including expansion joints).

Install semi-finishing trim where indicated, and where exterior gypsum board edges are not covered by applied moldings or indicated to receive trim with face flanges covered with joint compound.

Provide control joints horizontally and/or vertically at no less than 24'-0" o.c. max. Refer to plans for specific location or installed as directed by Architect.

Install H-molding in exterior gypsum drywall work where control joints are indicated.

## FINISHING OF DRYWALL:

General: Apply treatment at gypsum board joints (both directions), flanges of trim accessories, penetrations, fastener heads, surface defects and elsewhere as required to prepare work for decoration. Prefill open joints and rounded or beveled edges, if any, using type of compound recommended by manufacturer.

1. Apply joint tape at joints between gypsum boards, except where trim accessories are indicated.
2. Apply joint compound in 3 coats (not including prefill of openings in base), and sand between last 2 coats and after last coat.
3. Tape and finish gypsum board in accordance with ASTM C 840, GA 214 and GA 216.
4. Provide joint, fastener depression, and corner treatment. Do not use fiber glass mesh tape with conventional drying type joint compounds; use setting or hardening type compounds only. Provide treatment for water-resistant gypsum board as recommended by the gypsum board manufacturer.
5. Where gypsum surfaces are to be finished to Level 5 in accordance with GA 214, apply a thin skim coat of joint compound to the entire gypsum board surface, after the two-coat joint and fastener treatment is complete and dry.
6. **All Exposed gypsum board surfaces** shall be finished to a minimum **Level 4** in accordance with GA 214.
7. Where gypsum board is to receive eggshell, semi-gloss or gloss paint finish, or where severe, up or down lighting conditions occur, shall be finished to Level 5 in accordance to GA 214 Level 5, unless indicated otherwise.
8. All gypsum board surfaces at **all Corridors** shall be finished to **Level 5** in accordance to GA 214 Level 5.
9. All gypsum board surfaces at **all Classrooms** shall be finished to **Level 4** in accordance to GA 214.
10. Plenum areas above ceilings shall be finished to Level 1 in accordance with GA 214.
11. Water resistant gypsum backing board, ASTM C 630/C 630M, to receive ceramic tile shall be finished to Level 2 in accordance with GA 214.
12. Walls and ceilings to receive a heavy-grade wall covering or heavy textured finish before painting shall be finished to Level 3 in accordance with GA 214.

Partial Finishing: Omit third coat and sanding on concealed drywall work which is indicated for drywall finishing or which requires finishing to achieve fire-resistance rating, sound rating or to act as air or smoke barrier.

Refer to section on painting in Division 9 for decorative finishes to be applied to drywall work.



PROTECTION OF WORK:

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

END OF SECTION 09250

## SECTION 09510 - ACOUSTICAL CEILINGS

### PART 1 – GENERAL

#### RELATED DOCUMENTS:

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

#### SUMMARY:

Extent of acoustical ceilings specified in this section include the following:

1. Acoustical lay-in panel ceilings in an exposed suspended metal grid system.

#### SUBMITTALS:

Product Data: Submit manufacturer's technical data for each type of acoustical ceiling unit and suspension system required.

1. Full size sample of each acoustical panel type, pattern and color.
2. Set of 12" long samples of exposed runners and moldings for each color and system type required.

Certificates: Submit certificates from manufacturers of acoustical ceiling units and suspension systems attesting that their products comply with specification requirements.

#### QUALITY ASSURANCE:

Fire Performance Characteristics: Provide acoustical ceiling components that are identical to those tested for the following fire performance characteristics, according to ASTM test method indicated, by UL or other testing and inspecting agency acceptable to authorities having jurisdiction. Identify acoustical ceiling components with appropriate marking of applicable testing and inspecting agency.

1. Surface Burning Characteristics: As follows, tested per ASTM E 84.
2. Flame Spread: 25 or less.
3. Smoke Developed: 50 or less.

Fire Resistance Ratings: As indicated by reference to design designation in UL "Fire Resistance Directory" for floor, roof or beam assemblies in which acoustical ceilings function as a fire protective membrane; tested per ASTM E 119. Provide protection materials for lighting fixtures and air ducts to comply with requirements indicated for rated assembly.

Coordination of Work: Coordinate layout and installation of acoustical ceiling units and suspension system components with other work supported by, or penetrating through, ceilings, including light fixtures, HVAC equipment, fire-suppression system components (if any), and partition system (if any).

#### DELIVERY, STORAGE AND HANDLING:

Deliver acoustical ceiling units to project site in original, unopened packages and store them in a fully enclosed space where they will be protected against damage from moisture, direct sunlight, surface contamination or other causes.

Before installing acoustical ceiling units, permit them to reach room temperature and a stabilized moisture content.

Handle acoustical ceiling units carefully to avoid chipping edges or damaging units in any way.

#### PROJECT CONDITIONS:

Space Enclosures: Do not install interior acoustical ceilings until space is enclosed and weatherproof, wet-work in space is completed and nominally dry, work above ceilings is complete and ambient conditions of temperature and humidity will be continuously maintained at values near those indicated for final occupancy.

### PART 2 – PRODUCTS

VINYL COVERED CEILING PANELS: Where indicated provide 24" x 24" x 1/2" vinyl face and back covered gypsum ceiling panels equal to US&G "Sheetrock brand lay-In Ceiling Tile "ClimalPlus", in exposed suspended grid system. Color shall be "white".

Manufacturers: The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:

Georgia-Pacific Corporation  
Gold Bond Division of National Gypsum Company  
United States Gypsum Co.  
BPB America, Inc.

Equal products of other manufacturers may be used in the work provide such products have been approved, by the Architect, not less than five (5) days prior to scheduled bid opening.

Metal Suspension System with Vinyl Covered Panels: Equal to USG's Donn ZXLA galvanized steel grid with aluminum cap, with "white" finish.

#### ACOUSTICAL CEILING UNITS, GENERAL:

Standard for Acoustical Ceiling Units: Provide manufacturer's standard units of configuration indicated which are prepared for mounting method designated and which comply with FS SS-S-118 requirements, including those indicated by reference to type, form, pattern, grade (NRC or NIC' as applicable), light reflectance coefficient (LR), edge detail, and joint detail (if any).

1. Mounting Method for Measuring NRC: No. 7 (mechanically mounted on special metal support), FS SS-S-118; or Type E-400 mounting as per ASTM E 795.

Sound Attenuation Performance: Provide acoustical ceiling units with ratings for ceiling sound transmission class (STC) of range indicated as determined according to AMA 1-II "Ceiling Sound Transmission Test by Two-Room Method" with ceilings continuous at partitions and supported by a metal suspension system of type appropriate for ceiling unit of configuration indicated (concealed for tile, exposed for panels).

Colors, Textures and Patterns: Provide products to match appearance characteristics indicated or, if not otherwise indicated, as selected by Architect from manufacturer's standard colors, surface textures, and patterns available for acoustical ceiling units and exposed metal suspension system members of quality designated.

#### ACOUSTICAL PANELS:

Manufacturers: The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:

Equal to USG Acoustical Products Co. – "Radar ClimalPlus" in exposed suspended grid system.

US&G  
Armstrong World Ind. Inc.  
BPB

Equal products or other manufacturers may be used in the work provided such products have been approved by the Architect, not less than five (5) days prior to scheduled bid opening.

Mineral Composition Panels - Water-Felted-Lay-in; Provide Type III, Form 1 nits per FS SS-S-118 and complying with the following requirements:

1. Standard Units: Equal to US&G "Radar ClimalPlus" panels as follows:
  - a. Designation per FS SS-S-118: Pattern as selected by the Architect.
  - b. Color: "White"
  - c. Edge Detail: Square (Item #2210) and Tegular (Item #2220).
  - d. Size: 24" x 24" x 5/8", except as otherwise indicated.

METAL SUSPENSION SYSTEMS, GENERAL:

Standard for Metal Suspension Systems: Provide metal suspension systems of type, structural classification and finish indicated which comply with applicable STM C 635 requirements.

Finishes and Colors: Provide manufacturer's standard factory applied finish for type of system indicated. For exposed suspension members and accessories with painted finish, provide color indicated or, if not otherwise indicated, as selected by Architect from manufacturer's full range of standard colors.

1. "White".

Attachment Devices: Size for 5 times design load indicated in ASTM C 635, Table 1, Direct Hung.

Hanger Wire: Galvanized carbon steel wire, ASTM A 641, soft temper, prestretched, Class 1 coating, sized so that stress at 3- times hanger design load (ASTM C 635, Table 1, Direct Hung), will be less than yield stress of wire, but provide not less than 12 gage.

Edge Moldings and Trim: Provide shadow molding for edges equal to MS174. At penetrations of ceiling install manufacturer's standard molding which fits with type of edge detail and suspension system indicated.

1. For circular penetrations of ceiling, provide edge moldings fabricated to diameter required to fit penetration exactly.

Hold-Down/Impact Clips: Where indicated provide manufacturer's standard impact clip system design to absorb impact forces against lay-in panels. Install hold down clips at all ceiling panels within 10'-0" of and exterior door.

## EXPOSED METAL DIRECT-HUNG SUSPENSION SYSTEMS:

Non-Fire-Resistance-Rated Single Web Steel Suspension System: Manufacturer's standard system roll-formed from prefinished cold-rolled steel sheet with 15/16" wide exposed faces on flanges of structural members; other characteristics as follows:

Equal to USG's Donn DX hot dipped galvanized steel grid.

1. Structural Classification: Intermediate-Duty System.
2. Finish: "White".

Manufacturers: The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:

Chicago Metallic Corporation  
USG Interiors Inc.  
Armstrong World Industries, Inc.  
BPB America, Inc.

Equal products of other manufacturers may be used in the work provided such products have been approved by the Architect, not less than five (5) days prior to scheduled bid opening.

Acoustical Sealant: Resilient, non-staining, non-shrinking, non-hardening, non-skinning, non-drying, non-sag sealant intended for interior sealing of concealed construction joints.

Manufacturers: The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:

BA-98; Pecora Corp.  
Tremco Acoustical Sealant; Tremco

Equal products of other manufacturers may be used in the work provided such products have been approved by the Architect, not less than five (5) days prior to schedule bid opening.

## PART 3 – EXECUTION

### PREPARATION:

Coordination: Furnish layouts for inserts, clips, or other supports required to be installed by other trades for support of acoustical ceilings.

1. Furnish concrete inserts and similar devices to other trades for installation well in advance of time needed for coordination of other work.

Measure each ceiling area and establish layout of acoustical units to balance border widths at opposite edges of each ceiling. Coordinate ceiling layout with lighting layout. Avoid use of less-than-half width units at borders, and comply with reflected ceiling plans.

#### INSTALLATION:

General: Install materials in accordance with manufacturer's printed instructions, and to comply with governing regulations, fire-resistance rating requirements as indicated, and Cisca standards applicable to work.

Arrange acoustical units and orient directionally-patterned units (if any) in manner shown by reflected ceiling plans.

Install suspension systems to comply with ASTM C 636, with hangers supported only from building structural members. Locate hangers within 6" inches from each end and spaced 4'-0" along each carrying channel or direct-hung runner, unless otherwise indicated, leveling to tolerance of 1/8" in 12'-0".

Secure wire hangers by looping and wire-tying, either directly to structures or to inserts, eye-screws, or other devices which are secure and appropriate for substrate, and which will not deteriorate or fail with age or elevated temperature.

Install hangers plumb and free from contact with insulation or other objects within ceiling plenum which are not part of supporting structural or ceiling suspension system. Splay hangers only where required to miss obstructions and offset resulting horizontal force by bracing, countersplaying or other equally effective means.

Install edge moldings of type indicated at perimeter of acoustical ceiling area and at locations where necessary to conceal edges of acoustical units.

Sealant Bed: Apply continuous ribbon of acoustical sealant, concealed on back of vertical leg before installing moldings.

Screw-attached moldings to substrate at intervals not over 16" o.c. and not more than 3" from ends, leveling with ceiling suspension system to tolerance of 1/8" in 12'-0". Miter corners accurately and connect securely.

Install acoustical panels in coordination with suspension system with edges concealed by support of suspension members. Scribe and cut panels to fit accurately at borders and at penetrations.

Install hold-down clips on panels, within 10'-0" of exterior door openings, where panels are other than horizontal, and in areas where required by governing regulations or for fire-resistance ratings; space as recommended by panel manufacturer, unless otherwise indicated or required.

EXTRA STOCK:

Deliver stock of maintenance materials to Owner. Furnish maintenance materials from same manufactured lot as materials installed and enclosed in protective packaging with appropriate identifying labels.

1. Ceiling Tile: Furnish not less than one box for each type, color, pattern and size installed.

END OF SECTION 09510



## SECTION 09651 – ENGINEERED VINYL TILE (EVT)

### PART 1 – GENERAL

#### DESCRIPTION OF WORK:

Extent of the Luxury Vinyl Tile flooring and accessories is shown on drawings and in schedules.

#### QUALITY ASSURANCE:

Manufacturer: Provide each type of Luxury Vinyl Tile flooring and accessories as produced by a single manufacturer, including recommended primers, adhesives, sealants and leveling compounds.

1. Wherever possible, provide required Luxury Vinyl Tile flooring and accessories produced by a single manufacturer.

#### SUBMITTALS:

Product Data: Submit 2 copies of manufacturer's technical data and installation instructions for each type of Luxury Vinyl Tile flooring and accessory.

Samples: Submit, for verification purposes, samples of each type, color, and pattern of Luxury Vinyl Tile, including accessories, required, indicating full range of color and pattern variation.

#### JOB CONDITIONS:

Store Luxury Vinyl Tile flooring products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by the manufacture, but not less than 55 deg F (13 deg C) or more than 85 deg F (29 deg C).

Maintain minimum temperature of 65°F in spaces to receive Luxury Vinyl Plank Tile flooring for at least 48 hours prior to installation, during installation, and for not less than 48 hours after installation. Store Luxury Vinyl Tile materials in spaces where they will be installed for at least 48 hours before beginning installation.

Maintain the ambient relative humidity between 40% and 60% during installation.

Until Substantial Completion, maintain ambient temperatures within range recommended by the manufacture but not less than 55 deg F (13 deg C) or more than 85 deg F (29 deg C).

Install Luxury Vinyl Tile flooring and accessories after other finishing operations, including painting, have been completed. Do not install Luxury Vinyl Tile Flooring over concrete slabs until the latter have been cured and are sufficiently dry to achieve bond with adhesive as determined by manufacturer's recommended bond and moisture test.

## PART 2 – PRODUCTS

Manufacturers: The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:

BOLYU, Adairsville, GA.  
Mannington  
Armstrong World Industries, Inc.

Luxury Vinyl Tile Flooring - shall have a value of **\$4.00** dollars per square foot (allowances shall be for material only. Installation, profit, overhead, shipping and taxes shall be included in the Contractors Bid Proposal). If Architect chooses flooring of lesser value after Bid Process, the Contractor shall issue a deductive Change Order for the difference.

Equal products of other manufacturers may be used in the work, provided such products have been approved by the Architect, not less than five (5) days prior to scheduled bid opening.

### MATERIALS:

Luxury Vinyl Tile flooring with the following physical characteristics:

1. Construction High Performance Luxury Vinyl Tile flooring
2. Class / ASTM F 1700 Class III Printed Film Vinyl Tile, Type B (embossed)
3. Wear layer Thickness 20 mil or 0.020" (0.5 mm)
4. Overall Thickness 3 mm or nominal 0.125"
5. Nominal Dimensions 4" wide x 36" long
6. Backing Class Commercial Grade
7. Installation Glue Down
8. Slip Resistance / ASTM D 2047 >0.65 (wet/dry)
9. Warranty: 10 year limited commercial wear warranty.
10. Colors as selected by the Owner.

Concrete Slab Primer: Non-staining type as recommended by flooring manufacturer.

Leveling Compound: ProSpec Feather Edge, premium, polymer modified, rapid setting, trowelable underlayment that results in a very smooth, ultra thin finish or as recommended by the flooring manufacture.

Surfaces must be solid, completely clean, free of oil, gypsum compounds, wax, grease, sealers, curing compounds, asphalt, paint, dirt, loose surface material and any contaminants that act as a bond breaker. Weak concrete surfaces must be cleaned down to solid sound concrete by mechanical means. Acid etching or chemical cleaning is not acceptable. Remove all dirt by vacuuming. All subfloors must be clean, dry and at least 40° F (4° C) prior to applying ProSpec Feather Edge.

Installation: ProSpec Feather Edge will accept standard floor coverings such as VCT, vinyl sheet goods, tile and carpeting in approximately 15-30 minutes after placement.

Materials: Extruded rubber accessories as required (i.e. nosings, reducer strip.)

### ACCESSORIES

Wall Base: Provide rubber base complying with FS SS-W-40, Type I, with matching end stops and pre-formed or molded corner units (no field formed corners shall be accepted) and as follows:

1. Height: 4"
2. Thickness: 1/8"
3. Style: Standard Top-Set Cove
4. Finish: Matte

Stair Riser/Tread: Shall be equal to Roppe 1 piece Riser/Tread combination # 96, Vantage Raised Circular Design.

Manufacturers: The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:

Armstrong World Industries, Inc.  
Roppe Corporation  
Flexco

## PART 3 – EXECUTION

### EXAMINATION

Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the work.

Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.

Proceed with installation only after unsatisfactory conditions have been corrected.

## PREPARATION

Prepare substrates according to manufactures written instructions to ensure adhesion of Luxury Vinyl Tile Flooring.

1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
2. Remove substrate paint, coatings and other substances that are incompatible with adhesives or contain soap, wax, oil, solvents, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.
3. Mechanically remove contamination on the substrate that may cause damage to the resilient flooring material. Permanent and non-permanent markers, pens, crayons, paint, etc., must not be used to write on the back of the flooring material or used to mark the substrate as they could bleed through and stain the flooring material.
4. Prepare Substrates according to ASTM F 710 including the following:
  - a. Moisture Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrates pass testing.
    - 1) Perform anhydrous calcium chloride test, ASTM F 1869. Results must not exceed 5 lbs. Moisture Vapor Emission Rate per 1,000 sq. ft. in 24 hours.  
or –
    - 2) Perform relative humidity test using in situ probes, ASTM F 2170. Results must not exceed 80%.
  - b. A pH test for alkalinity must be conducted. Results should range between 7 and 9. If the test results are not within the acceptable range of 7 to 9, the installation must not proceed until the problem has been corrected.
  - c. Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer.

Fill cracks, holes, depressions and irregularities in the substrate with good quality Portland cement based underlayment leveling and patching compound and remove bumps and ridges to produce a uniform and smooth substrate.

Floor covering shall not be installed over expansion joints.

Do not install resilient products until they are the same temperature as the space where they are to be installed.

Move resilient products and installation materials into spaces where they will be

installed at least 48 hours in advance of installation.

Sweep and vacuum clean substrates to be covered by resilient products immediately before installation.

## FLOORING INSTALLATION

Comply with manufacturer's written instructions for installing resilient tile flooring.

1. Install with manufactures adhesive specified for the site conditions and follow adhesive label for proper use.
2. Follow manufactures recommendation and lay tiles so graining follows the same direction.
3. Roll the flooring in both directions using a 100 pound three-section roller.

Lay tile from center marks established with principal walls, discounting minor offsets, so that tile at opposite edges of room area of equal width. Adjust as necessary to avoid use of cut widths less than 1/2 tile at room perimeters. Lay tile square to room axis, from wall to wall and under all casework or other fixed equipment. Where construction joints in concrete slab occur, lay tile joint with construction joint.

Match tiles for color and pattern by using tile from cartons in same sequence as manufactured and packaged if so numbered. Cut tile neatly around all fixtures. Broken, cracked, chipped, or deformed tiles are not acceptable.

1. Lay each color of tile with grain running in basket weave pattern.

Adhere tile flooring to substrates using full spread of adhesive applied in compliance with flooring manufacturer's directions.

### Accessories:

Apply wall base to walls, columns, pilasters, casework and other permanent fixtures in rooms or areas where base is required. Install base in lengths as long as practicable, with preformed corner units, or fabricated from base materials with mitered or coped inside corners. Tightly bond base to substrate throughout length of each piece, with continuous contact at horizontal and vertical surfaces.

1. On masonry surfaces, or other similar irregular substrates, fill voids along top edge of resilient wall base with manufacturer's recommended adhesive filler material.

Place resilient edge strips tightly butted to flooring and secure with adhesive. Install edging strips at edges of flooring which would otherwise be exposed.

## CLEANING AND PROTECTION

Comply with manufacturer's written instructions for cleaning and protection of resilient products.

Perform the following operations immediately after completing resilient product installation:

1. Remove adhesive and other blemishes from exposed surfaces.
2. Sweep and vacuum surfaces thoroughly.
3. Damp-mop surfaces to remove marks and soil.

Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

No heavy traffic, rolling loads, or furniture placement for 72 hours after installation.

Cover resilient products until Substantial Completion.

Wait 72 hours after installation before performing initial cleaning.

A regular maintenance program must be started after the initial cleaning.

## EXTRA STOCK:

Deliver stock of maintenance materials to Owner. Furnish maintenance materials from same manufactured lot as materials installed and enclosed in protective packaging with appropriate identifying labels.

1. Flooring: Furnish not less than one box for each type, color, pattern and size installed.

END OF SECTION 09651

## SECTION 09680 – CARPETING

### PART 1 – GENERAL

#### RELATED DOCUMENTS

Drawings and general provisions of Contract including General and Supplementary Conditions and Division 1 Specification Sections apply to work of this section.

#### DESCRIPTION OF WORK

The extent of each type of carpeting is indicated on the drawings, and by specifications, and is defined to include carpet and accessories.

#### SUBMITTALS:

Product Data: Submit manufacturer's product data for each type of carpet specified.

Shop Drawings: Submit shop drawings indicating seam layout for approval by Architect.

#### QUALITY ASSURANCE

Installer: Firm with not less than 5 years of carpeting experience, similar to work of this section.

Manufacturer: Firm (Carpet Mill) with not less than 5 years of production experience with carpet similar to types specified in this section, and whose published product literature clearly indicates compliance of products with requirements of this section.

General Standard: "Carpet Specifier's Handbook" by the Carpet and Rug Institute; comply with recommendations which can be reasonably applied to types of carpeting work required.

Maintenance Materials: Deliver specified overrun (if any) and usable scraps of carpet to Owner's designated storage space, properly packaged (paper wrapped) and identified. Usable scraps are defined to include roll ends of less than 9'0" length, and pieces of more than 3 sq. ft. area and more than 8" wide. Dispose of smaller pieces.

#### PRODUCT DELIVERY AND STORAGE

Deliver carpeting material in protective wrapping, and store inside, protected from weather, moisture and soiling.

## WARRANTY

Provide special project warranty, signed by the Contractor, Installer and Manufacturer (Carpet Mill), agreeing to repair or replace defective materials and workmanship of carpeting work during a 1 year warranty period from date of final acceptance of the project. Attach copies of product warranties.

## PART 2 – PRODUCTS

Manufacturer: The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:

Tandus  
J+J Invision  
Bigelow Carpets

## MATERIALS:

Field Color: Carpet **squares** shall have a value of **\$28.00** dollars per square yard (allowances shall be for material only. Installation, profit, overhead, shipping and taxes shall be included in the Contractors Bid Proposal). If Architect chooses carpet of lesser value after Bid Process, the Contractor shall issue a deductive Change Order for the difference.

## PERFORMANCE

Permanent Static Protection: Dissipates unwanted static electricity and effectively prevents static build-up in excess of 3.0 KV at 70° F, 20% relative humidity when tested under AATC-134-75.

Flammability: DOC-FF-1-70 Pill Test passes. Floor Radiant Panel meets NFPA Class 1 when tested under ASTM E648 Glue Down. NBS Smoke Chamber NFPA-258 (450 or less) Flaming Mode.

Construction Materials: 100% man-made materials for superior stability. Specifications are subject to change without notice when such changes do not alter product performance. Slight color variations may occur from dye lot to dye lot.

## CARPET ACCESSORIES

Wall Base: See Section 09650 – Rubber Base.

Carpet Edge Guard, Metallic: Color as selected by Architect.

Reducer Strip: Install vinyl reducer strip where carpet meets other finishes.



Installation Adhesive: Water-resistant type as recommended by carpet or cushion manufacturer, and which complies with flammability requirements for installed carpet.

Seaming Cement: Hot-melt seaming adhesive or similar product recommended by carpet manufacturer, for taping seams and buttering cut edges at backing to form secure seams and prevent pile loss at seams.

Miscellaneous Materials: As recommended by manufacturers of carpet, cushions and other carpeting products; and selected by Installer to meet project circumstances and requirements.

## PART 3 – EXECUTION

### PRE-INSTALLATION REQUIREMENTS

Installer must examine substrates for moisture content and other conditions under which carpeting is to be installed, including the temperature of the area that the carpet is to be installed in, and notify Contractor in writing of conditions detrimental to proper completion of the work. Do not proceed until satisfactory conditions have been met.

Sequence carpeting with other work so far as to minimize the possibility of damage and soiling of carpet during remainder of construction period.

### INSTALLATION

#### GENERAL:

Comply with manufacturers' instructions and recommendations for seam locations and direction of carpet; maintain uniformity of direction and lay of pile. At doors, center seams under doors; do not place seams in traffic direction at doorways. Provide seam layout to Architect for approval before any work is performed.

Extend carpet under open-bottomed obstructions and under removable flanges and furnishings, and into alcoves and closets of each space.

Provide cut-outs where required, and bind cut edges properly where not concealed by protective edge guards or overlapping flanges.

Install carpet edge guard where edge of carpet is exposed; anchor guard to substrate.

#### GLUE-DOWN INSTALLATION

Fit sections of carpets into each space prior to application of adhesive. Trim edges and butter cuts with seaming cement.

Apply adhesive uniformly to substrate in accordance with manufacturers' instructions. Butt carpet edges tightly together to form seams without gaps. Roll lightly to eliminate air pockets and ensure uniform bond. Remove adhesive promptly from face of carpet.

All seams are to be sealed or bonded together with the manufacturer's approved product and method.

#### CLEANING AND PROTECTION

Remove debris, sorting pieces to be saved from scraps to be disposed of.

Vacuum carpet using commercial machine with face-beater element. Remove spots and replace carpet where spots cannot be removed.

Advise Contractor of protection methods and materials needed to ensure that carpeting will be without deterioration or damage at time of substantial completion.

END OF SECTION 09680

## SECTION 09900 – PAINTING

### PART 1 - GENERAL

#### RELATED DOCUMENTS:

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

#### DESCRIPTION OF WORK:

Extent of painting work is indicated on drawings and schedules, and as herein specified including accent painting.

Work includes painting and finishing of interior and exterior exposed items and surfaces throughout project, except as otherwise indicated.

1. Surface preparation, priming and coats of paint specified are in addition to shop-priming and surface treatments specified under other sections of work.

Work includes field painting of exposed bare and covered pipes and ducts (including color coding), and of hangers, exposed steel and iron work, and primed metal surfaces of equipment installed under mechanical and electrical work, except as otherwise indicated.

"Paint" as used herein means all coating systems materials, including primers, emulsions, enamels, stains, sealers and fillers, and other applied materials whether used as prime, intermediate or finish coats.

Surfaces to be Painted: Except where natural finish of material is specifically noted as a surface not to be painted, paint exposed surfaces whether or not colors are designated in "schedules". Where items or surfaces are not specifically mentioned, paint the same as similar adjacent materials or areas. If color or finish is not designated, Architect will select these from standard colors or finishes available.

Following categories of work are not included as part of field-applied finish work.

1. Pre-Finished Items: Unless otherwise indicated, do not include painting when factory-finishing or installer finishing is specified for such items as (but not limited to) metal toilet enclosures, prefinished partition systems, acoustic materials, elevator entrance doors and frames, elevator equipment, and finished mechanical and electrical equipment, including light fixtures, switchgear and distribution cabinets.

2. Concealed Surfaces: Unless otherwise indicated, painting is not required on surfaces such as walls or ceilings in concealed areas and generally inaccessible areas, foundation spaces, furred areas, utility tunnels, pipe spaces, duct shafts and elevator shafts.
3. Finished Metal Surfaces: Unless otherwise indicated, metal surfaces of anodized aluminum, stainless steel, chromium plate, copper, bronze and similar finished materials will not require finish painting.
4. Operating Parts: Unless otherwise indicated, moving parts of operating units, mechanical and electrical parts, such as valve and damper operators, linkages, sinkages, sensing devices, motor and fan shafts will not require finish painting.

Following categories of work are included under other sections of these specifications.

1. Shop Priming: Unless otherwise specified, shop priming of ferrous metal items is included under various sections for structural steel, metal fabrications, hollow metal work and similar items.
2. Unless otherwise specified, shop priming of fabricated components such as shop-fabricated or factory-built mechanical and electrical equipment or accessories is included under other sections of these specifications.

Do not paint over any code-required labels, such as Underwriters' Laboratories and Factory Mutual, or any equipment identification, performance rating, name, or nomenclature plates.

#### QUALITY ASSURANCE:

Single Source Responsibility: Provide primers and other undercoat paint produced by same manufacturer as finish coats. Use only thinners approved by paint manufacturer, and use only within recommended limits.

Coordination of Work: Review other sections of these specifications in which prime paints are to be provided to ensure compatibility of total coatings system for various substrates. Upon request from other trades, furnish information or characteristics of finish materials provided for use, to ensure compatible prime coats are used.

#### SUBMITTALS:

Product Data: Submit manufacturer's technical information including paint label analysis and application instructions for each material proposed for use.

Samples: Prior to beginning work, Architect will furnish color chips for surfaces to be painted. Use representative colors when preparing samples for review. Submit samples for Architect's re- view of color and texture only.

Provide a listing of material and application for each coat of each finish sample. Provide a 4' x 4' sample application of each color paint for Architect's approval prior to final ordering of product. Sample application shall be applied in an inconspicuous place, satisfactory to the Architect.

#### DELIVERY AND STORAGE:

Deliver materials to job site in original, new and unopened packages and containers bearing manufacturer's name and label, and following information:

1. Name or title of material.
2. Fed. Spec. number, if applicable.
3. Manufacturer's stock number and date of manufacturer.
4. Manufacturer's name.
5. Contents by volume, for major pigment and vehicle constituents.
6. Thinning instructions.
7. Application instructions.
8. Color name and number.

Store materials not in actual use in tightly covered containers. Maintain containers used in storage of paint in a clean condition, free of foreign materials and residue.

1. Protect from freezing where necessary. Keep storage area neat and orderly. Remove oily rags and waste daily. Take all precautions to ensure that workmen and work areas are adequately protected from fire hazards and health hazards resulting from handling, mixing and application of paints.

#### JOB CONDITIONS:

Apply water-base paints only when temperature of surfaces to be painted and surrounding air temperatures are between 50 degree F and 90 degrees F, unless otherwise permitted by paint manufacturer's printed instructions.

Apply solvent-thinned paints only when temperature of surfaces to be painted and surrounding air temperatures are between 45 degree F and 95 degree F, unless otherwise permitted by paint manufacturer's printed instructions.

Do not apply paint in snow, rain, fog or mist, or when relative humidity exceeds 85% or to damp or wet surfaces, unless otherwise permitted by paint manufacturer's printed instructions.

1. Painting may be continued during inclement weather if areas and surfaces to be painted are enclosed and heated within temperature limits specified by paint manufacturer during application and drying periods.

## PART 2 – PRODUCTS

Manufacturers: The following manufacturers' are listed as acceptable substitutions to the establish minimum standards. Sherwin Williams Products are listed as the standard of product performance and quality.

Sherwin Williams Paint Company (SW)  
Dulux Paint Company  
Benjamin Moore and Co. (Moore).  
Pittsburgh Paints (PPG).  
Pratt and Lambert (P & L).  
Martin Senour Paint Company

Equal products of other manufacturers may be used in the work, provided such products have been approved by the Architect, not less than five (5) days prior to scheduled bid opening.

### MATERIALS:

Material Quality: Provide best quality grade of various types of coatings as regularly manufactured by acceptable paint materials manufacturers. Materials not displaying manufacturer's identification as a standard, best-grade product will not be acceptable.

1. Proprietary names used to designate colors or materials are not intended to imply that products of named manufacturers are required to exclusion of equivalent products of other manufacturers.
2. Federal Specifications establish minimum acceptable quality for paint materials. Provide written certification from paint manufacturer that materials provided meet or exceed these minimums.
3. Manufacturer's products which comply with coating qualitative requirements of applicable Federal Specifications, yet differ in quantitative requirements, may be considered for use when acceptable to Architect. Furnish material data and manufacturer's certificate of performance to Architect for any proposed substitutions.

Color Pigments: Pure, non-fading, applicable types to suit substrates and service indicated.

## PART 3 – EXECUTION

### INSPECTION:

**Applicator must examine areas and conditions under which painting work is to be applied and notify Contractor in writing of conditions detrimental to proper and**

**timely completion of work. Do not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to Applicator. If work is begun before satisfactory conditions are met, then it shall be the Applicators' responsibility for the finish surfaces conditions.**

Starting of painting work will be construed as Applicator's acceptance of surfaces and conditions within any particular area.

Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions otherwise detrimental to formation of a durable paint film.

#### SURFACE PREPARATION:

General: Perform preparation and cleaning procedures in accordance with paint manufacturer's instructions and as herein specified, for each particular substrate condition.

1. Provide barrier coats over incompatible primers or remove and reprime as required. Notify Architect in writing of any anticipated problems in using the specified coating systems with substrates primed by others.
2. Remove hardware, hardware accessories, machined surfaces, plates, lighting fixtures, and similar items in place and not to be finish-painted, or provide surface-applied protection prior to surface preparation and painting operations. Remove, if necessary, for complete painting of items and adjacent surfaces. Following completion of painting of each space or area, reinstall removed items.
3. Clean surfaces to be painted before applying paint or surface treatments. Remove oil and grease prior to mechanical cleaning. Program cleaning and painting so that contaminants from cleaning process will not fall onto wet, newly-painted surfaces.

Cementitious Materials: Prepare cementitious surfaces of concrete, concrete block, cement plaster and cement-asbestos board to be painted by removing efflorescence, chalk, dust, dirt, grease, oils, and by roughening as required to remove glaze.

1. Determine alkalinity and moisture content of surfaces to be painted by performing appropriate tests. If surfaces are found to be sufficiently alkaline to cause blistering and burning of finish paint, correct this condition before application of paint. Do not paint over surfaces where moisture content exceeds that permitted in manufacturer's printed directions.
2. Clean concrete floor surfaces scheduled to be painted with a commercial solution of muriatic acid, or other etching cleaner. Flush floor with clean water to neutralize acid, and allow to dry before painting.

Wood: Clean wood surfaces to be painted of dirt, oil, or other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sandpaper smooth those finished surfaces exposed to view, and dust off. Scrape and clean small, dry, seasoned knots and apply a thin coat of white shellac or other recommended knot sealer, before application of priming coat. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood-filler. Sandpaper smooth when dried.

1. Prime, stain, or seal wood required to be job-painted immediately upon delivery to job. Prime edges, ends, faces, undersides, and backsides of such wood, including cabinets, counters, cases, paneling.
2. When transparent finish is required, use spar varnish for backpriming.
3. Backprime all exposed exterior wood. Backprime paneling on interior partitions only where masonry, plaster, or other wet wall construction occurs on backside.
4. Seal tops, bottoms, and cut-outs of unprimed wood doors with a heavy coat of varnish or equivalent sealer immediately upon delivery to job.

Ferrous Metals: Clean ferrous surfaces, which are not galvanized or shop-coated, of oil, grease, dirt, loose mill scale and other foreign substances by solvent or mechanical cleaning.

1. Touch-up shop-applied prime coats wherever damaged or bare. Clean and touch-up with same type shop primer.

Galvanized Surfaces: Clean free of oil and surface contaminants with non-petroleum based solvent.

#### MATERIALS PREPARATION:

Mix and prepare painting materials in accordance with manufacturer's directions.

Maintain containers used in mixing and application of paint in a clean condition, free of foreign materials and residue.

Stir materials before application to produce a mixture of uniform density, and stir as required during application. Do not stir surface film into material. Remove film and, if

#### APPLICATION:

General: Apply paint in accordance with manufacturer's directions. Use applicators and techniques best suited for substrate and type of material being applied.

1. Paint colors, surface treatments, and finishes, are indicated in "schedules" of the contract documents.
2. Provide finish coats which are compatible with prime paints used.



3. Apply additional coats when undercoats, stains or other conditions show through final coat of paint, until paint film is of uniform finish, color and appearance. Give special attention to insure that surfaces, including edges, corners, crevices, welds, and exposed fasteners receive a dry film thickness not less than specified thickness.
4. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Paint surfaces behind permanently-fixed equipment or furniture with prime coat only before final installation of equipment.
5. Paint interior surfaces of ducts, where visible through registers or grilles, with a flat, non-specular black paint.
6. Paint back sides of access panels, and removable or hinged covers to match exposed surfaces.
7. Finish exterior doors on tops, bottoms and side edges same as exterior faces, unless otherwise indicated.
8. Sand lightly between each succeeding enamel or varnish coat.
9. Omit first coat (primer) on metal surfaces which have been shop-primed and touch-up painted, unless otherwise indicated.

Scheduling Painting: Apply first-coat material to surfaces that have been cleaned, pretreated or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.

1. Allow sufficient time between successive coatings to permit proper drying. Do not recoat until paint has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and application of another coat of paint does not cause lifting or loss adhesion of the undercoat.

Minimum Coating Thickness: Apply materials at not less than manufacturer's recommended spreading rate, to establish a total dry film thickness as indicated or, if not indicated, as recommended by coating manufacturer.

Prime Coats: Apply prime coat where required to be painted or finished, and which has not been primed coated by others.

1. Recoat primed and sealed surfaces where there is evidence of suction spots or unsealed areas in first coat, to assure a finish coat with no burn-through or other defects due to insufficient sealing.

Pigmented (Opaque) Finishes: Completely cover to provide an opaque, smooth surface of uniform finish, color, appearance and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness or other surface imperfections will not be acceptable.

Transparent (Clear) Finishes: Use multiple coats to produce glass-smooth surface film of even luster. Provide a finish free of laps, cloudiness, color irregularity, runs, brush marks, orange peel, nail holes, or other surface imperfections.

1. Provide satin finish for final coats, unless otherwise indicated.

Completed Work: Match approved samples for color, texture and coverage. Remove, refinish or repaint work not in compliance with specified requirements.

#### FIELD QUALITY CONTROL:

The right is reserved by Owner to invoke the following material testing procedure at any time, and any number of times during period of field painting:

1. Engage services of an independent testing laboratory to sample paint being used. Samples of materials delivered to project site will be taken, identified and sealed, and certified in presence of Contractor.
2. Testing laboratory will perform appropriate tests for any or all of following characteristics: Abrasion resistance, apparent reflectivity, flexibility, washability, absorption, accelerated weathering, dry opacity, accelerated yellowness, recoating, skinning, color retention, alkali resistance and quantitative materials analysis.

If test results show that material being used does not comply with specified requirements, Contractor may be directed to stop painting work, and remove non-complying paint; pay for testing; repaint surfaces coated with rejected paint; remove rejected paint from previously painted surfaces if, upon repainting with specified paint, the two coatings are non-compatible.

#### CLEAN-UP AND PROTECTION:

Clean-Up: During progress of work, remove from site discarded paint materials, rubbish, cans and rags at end of each day.

Upon completion of painting work, clean window glass and other paint-spattered surfaces. Remove spattered paint by proper methods of washing and scraping, using care not to scratch or otherwise damage finished surfaces.

Protection: Protect work of other trades, whether to be painted or not, against damage by painting and finishing work. Correct any damage by cleaning, repairing or replacing, and repainting, as acceptable to Architect.

1. Provide "Wet Paint" signs as required to protect newly painted finishes. Remove temporary protective wrappings provided by others for protection of their work, after completion of painting operations.

At completion of work of other trades, touch-up and restore all damaged or defaced painted surfaces.

## EXTRA STOCK:

Deliver stock of maintenance materials to Owner. Furnish maintenance materials from same manufactured lot as materials installed and enclosed in protective packaging with appropriate identifying labels.

1. Paint: Furnish not less than one gallon for each type and color, applied.

## **EXTERIOR PAINT SCHEDULE**

General: Provide the following paint systems for the various substrates, as indicated.

Paint all new penetrations at roof areas, including roof attic ventilators and exhaust fan housings.

Paint exposed metals (steel lintels, conduit, etc.) as required and as indicated on plans.

Ferrous Metals: Gloss Alkyd Enamel: 2 Finish coats over primer with total dry film thickness of not less than 6.0 mils.

- |           |  |
|-----------|--|
| 1st Coat: | S-W Pro-Cryl® Universal Acrylic Primer B66-310 Series<br>(2.0 - 4.0 mils dry per coat) |
| 2nd Coat: | S-W Industrial Enamel, B54 Series  |
| 3rd Coat: | S-W Industrial Enamel, B54 Series, (2-4 mils dry per coat)                             |

Zinc-Coated Metal: Gloss Alkyd Enamel: 2 Finish coats over primer with total dry film thickness of not less than 2.5 mils.

- |           |  |
|-----------|--|
| 1st Coat: | S-W Pro-Cryl® Universal Acrylic Primer B66-310 Series<br>(2.0 - 4.0 mils dry per coat) |
| 2nd Coat: | S-W Industrial Enamel, B54 Series  |
| 3rd Coat: | S-W Industrial Enamel, B54 Series, (2-4 mils dry per coat)                             |

## **INTERIOR PAINT SCHEDULE**

General: Provide the following paint systems for the various substrates, as indicated on drawings, schedules and specifications.

Paint exposed metals (steel framing, mechanical ducts, conduit, etc.) as indicated on plans.

Painter shall identify all fire and smoke partitions above lay in ceilings as follows: Wording shall be "FIRE AND SMOKE BARRIERS - PROTECT ALL OPENINGS" (4" high), to be applied every 8'- 0" o.c.

Concrete Masonry Units: Alkyd Semi-Gloss Enamel Finish: 2 Finish coats over filled surface with total dry film thickness of not less than 11.4 mils.

- 1st Coat: S-W PrepRite® Block Filler, B25W25  
(75-125 sqft / gal. – 16 mils wet, 8.0 mils dft)
- 2nd Coat: S-W ProMar® 200 Latex Semi-Gloss, B31W2200 Series
- 3rd Coat: S-W ProMar® 200 Latex Semi-Gloss, B31W2200 Series  
(4 mils wet, 1.3 mils dry per coat)

Drywall Systems: 3 coats with total dry film thickness not less than 3.5 mils

Drywall Walls and Ceilings: Interior Semi-Gloss Finish Acrylic Latex with dry film thickness not less than 3.8 mils.

- 1st Coat: S-W PrepRite® 200 Latex Primer, B28W200  
(4 mils wet, 1.2 mils dry)
- 2nd Coat: S-W ProMar® 200 Latex Eggshell, B31W2200 Series
- 3rd Coat: S-W ProMar® 200 Latex Eggshell, B31W2200 Series  
(4 mils wet, 1.3 mils dry per coat)

Zinc-Coated Metal: Alkyd Gloss Finish: 2 Coats over primer, with total dry film thickness not less than 6.0 mils.

- 1st Coat: S-W Pro-Cryl® Universal Acrylic Primer B66-310 Series  
(2.0 - 4.0 mils dry per coat)
- 2nd Coat: S-W Industrial Enamel, B54 Series
- 3rd Coat: S-W Industrial Enamel, B54 Series, (2-4 mils dry per coat)

Ferrous Metal: Alkyd Gloss Enamel Finish: 2 Finish Coats over primer, with total dry film thickness not less than 6.0 mils.

- 1st Coat: S-W Pro-Cryl® Universal Acrylic Primer B66-310 Series  
(2.0 - 4.0 mils dry per coat)
- 2nd Coat: S-W Industrial Enamel, B54 Series
- 3rd Coat: S-W Industrial Enamel, B54 Series, (2-4 mils dry per coat)

Stained Woodwork: Stained - Varnish Rubbed Finish: 3 Finish Coats over stain plus filler on open grain wood.

- 1st Coat: S-W WoodClassics Oil Stain, A49 Series, (450-500 sq ft/gal)
- 2nd Coat: S-W WoodClassics Polyurethane Varnish, A67 Series
- 3rd Coat: S-W WoodClassics Polyurethane Varnish, A67 Series  
(350-400 sq ft/gal)

END OF SECTION 09900

## SECTION 10100 - MARKABLE BOARDS AND TACKBOARDS

### PART 1 – GENERAL

#### RELATED DOCUMENTS:

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

#### DESCRIPTION OF WORK:

Extent of markable boards (M.B.) and tackboards (T.B.) is shown on drawings.

Types of markable boards and tackboards specified in this section include the following:

1. Markable Boards
2. Vinyl Fabric-Faced Cork Tackboards

#### QUALITY ASSURANCE:

Manufacturer: Unless otherwise acceptable to Architect, furnish all markable boards and tackboards by one manufacturer for entire project.

#### SUBMITTALS:

Product Data: Submit manufacturer's technical data and installation instructions for each material and component part, including data substantiating that materials comply with requirements.

Samples: Submit full range of color samples for each type of markable board, tackboard, trim and accessories required. Provide 12" square samples of sheet materials and 12" lengths of trim members for color verification after selections have been made.

Shop Drawings: Submit for each type of markable board and tackboard. Include sections of typical trim members and dimensioned elevations. Show anchors, grounds, reinforcement, accessories, and installation details.

## SPECIAL PROJECT WARRANTY:

Warranty on Porcelain Enamel Markable Boards: Provide written warranty, signed by manufacturer, agreeing to replace, within warranty period, porcelain enamel remarkable boards which do not retain original writing and erasing qualities, defined to include surfaces which become slick and shiny, or exhibit crazing, cracking or flaking; provided manufacturer's instructions for handling, installing, protecting and maintaining markable boards have been adhered to during the warranty period. Replacement is limited to material replacement only and does not include labor for removal and reinstallation.

1. Warranty Period: 50 years from date of substantial completion or lifetime of the building.

## PART 2 – PRODUCTS

Manufacturer: The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:

### Manufacturers of Markable Boards and Tackboards:

Claridge Products and Equipment, Inc.

Perlite Markerboard and Tackboard

PolyVision, Inc.

American Visual Display

Equal products of other manufacturers may be used in the work, provided such products have been approved by the Architect not less than five (5) days prior to scheduled bid opening.

## MATERIALS:

Colors and Textures: Color to be selected from manufactures standards.

Markable Boards (M.B.) - Markable boards shall be porcelain enamel writing surface as manufactured by PolyVision, Inc. Writing surface shall have magnetic properties and perform as follows:

1. As a Writing Surface: The writing surface shall accept various writing medium including but not limited to chalk, pencil, water base marker, ball point pen, and fiber tip pen. All markings shall be clearly visible and easily cleaned.
2. As a Projection Surface: Projected images shall be clearly visible from any angle.

3. Board Construction shall include the following:
  - a. Facing sheet shall be porcelain enamel (P3 ceramicsteel) fused to 28 gauge steel face at approximately 1500 degrees F. Core shall be 1/2" particleboard with 0.005" aluminum backing sheet.
  - b. Provide single piece units up to 4' x 16'. Where overall sizes exceed manufacturer's maximum size, provide two or more panels of equal size as acceptable to the Architect.

Tackboards (T.B.): Vinyl faced fabric complying with FS CCC-W-408, Type II, mildew resistant, laminated to 1/4" thick cork backing sheet. Furnish materials as required for tack strips.

1. Unless otherwise indicated, make up rigid panels by factory-laminating under pressure to 1/4" thick exterior type plywood or hardboard backing.
2. Color: Color to be selected from manufactures standards.

#### Trim and Accessories:

General: Fabricate frames and trim of not less than 0.062" thick aluminum alloy, size and shape as indicated, to suit type of installation. Provide straight, single-length units wherever possible and keep joints to minimum. Miter corners to neat, hairline closure.

Aluminum Finish: Furnish exposed aluminum trim, accessories and fasteners with the following finish:

1. Finish: Manufacturer's standard satin aluminum finish.

Chalktrough: Furnish continuous aluminum chalktroughs for each markable board, unless otherwise indicated, as follows:

1. Solid extrusion, manufacturer's standard ribbed section, enclosed chalk tray with solid end caps, smoothly curved with concealed mounting.

Maprails and Maphooks: Furnish continuous aluminum maprails with cork tackstrip inserts for each markable board. Provide one pair of paper holders and one pair of maphooks for each 4 foot of remarkable board length. Provide flag holder and 1 pair of roller brackets.

#### FABRICATION:

Assembly: Provide factory-assembled markable board and tackboard units unless field-assembled units indicated.

Make joints only where total length exceeds maximum manufactured length. Fabricate with minimum number of joints, balanced around center of board, as acceptable to Architect.

Provide manufacturer's standard vertical joint system between abutting sections of markable board.

1. Provide mullion trim at joints between markable board and tackboard.

### PART 3 – EXECUTION

INSTALLATION: Verify mounting heights with Owner prior to installation.

Deliver factory-built markable board and tackboard units completely assembled in one piece without joints, whenever possible. Where dimensions exceed panel size, provide 2 or more pieces of equal length as acceptable to Architect. When overall dimensions require delivery in separate units, prefit at factory, disassembled for delivery, and make final joints at site. Use splines at joints to maintain surface alignment.

Install units in locations as shown on drawings and mounted at heights as directed by the Owner, keeping perimeter lines straight, plumb, and level. Provide all grounds, clips, backing materials, adhesives, brackets, anchors, trim, and accessories for complete installation.

### ADJUST AND CLEAN:

Verify accessories required for each unit properly installed and operating units properly functioning.

Clean units in accordance with manufacturer's instructions, breaking in only as recommended.

END OF SECTION 10100



## SECTION 10160 - TOILET PARTITIONS

### PART 1 - GENERAL

#### RELATED DOCUMENTS:

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

#### DESCRIPTION OF WORK:

Extent of toilet partitions is indicated on drawings.

Types of toilet partitions and screens required include the following:

1. Solid phenolic with fused surface laminate, floor-supported, overhead-braced.

Toilet accessories are specified elsewhere in Division 10.

#### QUALITY ASSURANCE:

Field Measurements: Take field measurements prior to preparation of shop drawings and fabrication where possible, to ensure proper fitting of work. However, allow for adjustments within specified tolerances wherever taking of field measurements before fabrication might delay work.

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

#### SUBMITTALS:

Product Data: Submit manufacturer's detailed technical data for materials, fabrication, and installation, including catalog cuts of anchors, hardware, fastenings, and accessories.

Shop Drawings: Submit shop drawings for fabrication and erection of toilet partition assemblies not fully described by product drawings, templates, and instructions for installation of anchorage devices built into other work.

Samples: Submit full range of color samples for each type of unit required. Submit 6" square samples of each color and finish on same substrate to be used in work, for color selections.

## PART 2 – PRODUCTS

Manufacturers: The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:

Bobrick Wasroom Equipment  
General Partitions  
Global (ASI)  
Bradley Partitions  
Columbia Partitions

Equal products of other manufacturers may be used in the work, provided such products have been approved, by the Architect, not less than five (5) days prior to scheduled bid opening.

### MATERIALS:

General: Provide materials which have been selected for surface flatness and smoothness. Exposed surfaces which exhibit pitting, seam marks, roller marks, stains, discolorations, telegraphing of core material, or other imperfections on finished units are not acceptable.

Materials: Doors, panels and pilasters are composed of compressed cellulose fibers impregnated with resins. The surface laminate is fused to the resin-impregnated core. All edges are machined and finished smooth with beveled edge. Material will not delaminate even under extreme conditions. Materials are non-absorbent, impact and graffiti resistant. Materials are impervious to steam, soaps and detergents and will not mildew.

Panels: Shall be 1/2" thick with eased edges uniformly machined to a 1/16" radius. Panels are 58" high and anchored to walls with 18 gauge stainless steel continuous brackets and continuous stainless steel brackets at panel to pilaster locations.

Doors: Shall be 3/4" thick with eased edges uniformly machined to a 1/16" radius. Doors are 58" high and mounted to pilasters with continuous stainless steel surface mounted hinge. Pre-threaded inserts are to be provided for all door hardware. Each door is furnished with one coat hook/bumper, slide latches, stops and pulls (for outswing doors) to be made of stainless steel. Door hardware shall allow for lift up emergency access.

Pilasters: Shall be 3/4" thick with eased edges uniformly machined to a 1/16" radius. Pilasters are 83" high (or as indicated on the drawings) and anchored to panels and walls with continuous stainless steel brackets. The pilasters contain no less than two level adjusting bolts on the bottom and attach to the floor with two 3/4" expansion bolts and are braced at the top with aluminum headrail.

Stainless Steel Pilaster Shoes: Shall be 3" high, and constructed of 20-gauge stainless steel. Pilaster shoes are bolted onto pilaster with stainless steel, tamper resistant sex bolts and screws.

Latches and Keepers: Shall be fabricated from stainless steel with a satin finish. Latch is mounted onto door with 1/4" stainless steel torx head bolts pre-threaded inserts and acts as the stop for inswing doors. Keepers are mounted on the pilasters with stainless steel toex head screws.

Headrail: Shall be made of heavy-duty extruded aluminum (6463-T5 alloy) with bright-dip anodized finish. Headrail is anti-grip and attaches to the top of the pilasters with stainless steel, tamper resistant torx screws. Headrail is attached to the adjacent wall construction with a stainless steel headrail bracket.

Headrail Bracket: Shall be made of 16 gauge stainless steel and is attached to the adjacent wall construction with #14 x 1½" stainless steel phillips-head screws and plastic anchors.

Anchorage and Fasteners: Manufacturer's standard exposed fasteners of stainless steel with pinhead, torx screws and bolts.

#### FABRICATION:

General: Furnish standard doors, panels, screens, and pilasters fabricated for partition system, unless otherwise indicated. Furnish units with cutouts, drilled holes, and internal reinforcement to receive partition-mounted hardware, accessories, and grab bars, as indicated.

Door Dimensions: Unless otherwise indicated, furnish 24" wide inswinging doors for ordinary toilet stalls and 32" wide (clear opening) outswinging doors at stalls equipped for use by handicapped.

Overhead-Braced Partitions: Furnish stainless steel supports and leveling bolts at pilasters, as recommended by manufacturer to suit floor conditions. Make provisions for setting and securing continuous aluminum overhead-bracing tube at top of each pilaster. Furnish shoe at each pilaster to conceal supports and leveling mechanism.

Floor-Supported Partitions: furnish galvanized steel anchorage devices, complete with threaded rods, lock washers, and leveling adjustment nuts at pilasters, to permit structural connection at floor. Furnish shoe at each pilaster to conceal anchorage.

Floor-Supported Over-Head Braced Screens: Furnish pilasters not less than 3/4" in thickness, panels and pilasters of same construction and finish as toilet partitions. Furnish galvanized steel anchorage devices, complete with threaded rods, lock washers, and leveling adjusting nuts at pilasters, to permit structural connection to floor. Furnish shoe at pilaster to conceal anchorage.

Accessories: Furnish units with chromium-plated finish, unless otherwise indicated.

### PART 3 – EXECUTION

#### INSTALLATION:

General: Comply with manufacturer's recommended procedures and installation sequences. Install partitions rigid, straight, plumb, and level.

Provide clearances of not more than 1/2" between pilasters and panels, and not more than 1" between panels and walls. Secure panels to walls with full length stainless steel brackets. Secure panels to pilasters with not less than two stirrup brackets located to align with stirrup brackets at wall. Secure panels in position with manufacturer's recommended anchoring devices.

Overhead-Braced Partitions and Screens: Secure pilasters to floor and level, plumb, and tighten installation with devices furnished. Secure overhead-brace to each pilaster with not less than two fasteners. Hang doors and adjust so that tops of doors are parallel with overhead-brace when doors are in closed position.

Floor-Supported Partitions: Set pilaster units with anchorages having not less than 2" penetration into structural floor, unless otherwise recommended by partition manufacturer. Level, plumb and tighten installation with devices furnished. Hang doors and adjust so that tops of doors are level with tops partition when doors are in closed position.

Screens: Attach with concealed anchoring devices, as recommended by manufacturer to suit supporting structure. Set units to provide support and to resist lateral impact.

Accessories: Mount accessories to partition units in accordance with manufacturer's instructions.

#### ADJUST AND CLEAN:

Hardware Adjustment: Adjust and lubricate hardware for proper operation. Set hinges on inswinging doors to hold open approximately 30 degrees from closed position when unlatched. Set hinges on outswinging doors (and entrance swing doors) to return to fully closed position.

Clean exposed surfaces of partition systems using materials and methods recommended by manufacturer, and provide protection as necessary to prevent damage during remainder of construction period.

END OF SECTION 10160

## SECTION 10410 - IDENTIFYING DEVICES

### PART 1 - GENERAL

#### RELATED DOCUMENTS:

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

#### DESCRIPTION OF WORK:

Note to the Contractor: If the Contract Sum (as awarded) is \$100,000.00 or more, the Contractor shall furnish and erect a project sign and interior plaques as shown in "Detail of Project Sign" (ABC Form C-15) and "Plaque Detail" bound in the Project Manual at the end of "General Conditions". The project sign shall be erected in a prominent location selected by the Architect and Owner and shall be maintained in good condition until completion of Work.

Extent of signs and plaque is indicated on the drawings.

Types of identifying devices specified in this section include the following:

1. Plaque
2. Room Signs (See Door Schedule)
3. Project Sign
4. Metal Letters
5. Storm Shelter Signage
6. Occupancy Sign

#### QUALITY ASSURANCE:

Drawings and Specifications are based on one manufacturer's standard products. Another standard system of a similar and equivalent nature may be acceptable when the differences do not materially detract from the design concept or intended performance as judged solely by the Architect. Verify signage requirements with Owner and Architect before ordering.

#### SUBMITTALS:

Shop Drawings: Submit shop drawings for each type of device. Include large scale sections of typical members and other components. Provide dimensioned elevations. Show anchorages, grounds and reinforcement and indicate finishes.

## PART 2 – PRODUCTS

1. Project Sign: Wording on the project sign shall be:

STATE OF ALABAMA

THE FRANKLIN COUNTY BOARD OF EDUCATION  
MR. MIKE SHEWBART, CHAIRPERSON  
MR. TERRY WELBORN, VICE CHAIRPERSON  
MR. RALTON BAKER, BOARD MEMBER  
MR. SHANNON OLIVER, BOARD MEMBER  
MR. PAT COCHRAN, BOARD MEMBER  
MR. GREG HAMILTON, SUPERINTENDENT

*"Progress through Education"*

A NEW SCIENCE AND BAND BUILDING AT  
VINA HIGH SCHOOL  
RUSSELLVILLE, ALABAMA

STATE BUILDING COMMISSION

McKEE AND ASSOCIATES - ARCHITECTURE AND INTERIOR DESIGN

NAME TO BE FURNISHED - CONTRACTOR

2. Plaque: Provide 24" x 30" cast aluminum-bronze finish plaque.

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MR. PAT COCHRAN, BOARD MEMBER  
MR. GREG HAMILTON, SUPERINTENDENT

SUPERVISED BY - STATE OF ALABAMA BUILDING COMMISSION

McKEE AND ASSOCIATES - ARCHITECTURE AND INTERIOR DESIGN

NAME TO BE FURNISHED - CONTRACTOR

Furnish Rubbing to Architect for approval.

Manufacturers: The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function.

1. Plaque and Metal Letters

**Impact Architectural Signs**, [www.impactsigns.com](http://www.impactsigns.com); 26 E. Burlington Avenue, LaGrange, IL 60525; (708) 469-7178; [impact@impactsigns.com](mailto:impact@impactsigns.com)

**Leeds Architectural Letters of Alabama Inc**, [www.leedsletters.com](http://www.leedsletters.com); P.O. Box 40, Leeds, AL 35094; Phone (205) 699-5271; Fax (205) 699-3342

**Matthews Architectural Products**, [www.matthewsid.com](http://www.matthewsid.com); 2 North Shore Pittsburgh, PA 15212; (412) 571-5500; (800) 950-1317

2. Room Signs and Storm Shelter Signage

**ASI Sign Systems, Inc.**, 8181 Jetstar Drive, Suite 100, Irving, TX 75063; [www.asisignage.com](http://www.asisignage.com); 1-800-274-7732

**Best Sign Systems**, [www.bestsigns.com](http://www.bestsigns.com); 1202 N. Park Avenue, Montrose, CO 81401-3171, Phone (970) 249-2378 or 1-800-235-2378; Fax (970) 249-0223

**Leeds Architectural Letters of Alabama Inc**, [www.leedsletters.com](http://www.leedsletters.com); P.O. Box 40, Leeds, AL 35094; Phone (205) 699-5271; Fax (205) 699-3342

**Bayuk Graphic Systems, Inc.**, [www.bayukgraphics.com](http://www.bayukgraphics.com); 5005 Old Lincoln Highway Parkesburg, PA 19365; Phone: (717)-442-0274; Fax: (717)-442-1289

Equal products of other manufacturers may be used in the work, provided such products have been approved by the Architect, not less than five (5) days prior to scheduled bid opening.

Room Signs: Provide 6" x 8" high laminated plastic with raised lettering complying with the Americans with Disabilities Act (ADA), color as selected by the Architect. Use International Symbols of accessibility for identifying facilities as accessible. Letters and numerals shall be raised 1/32 in (0.8 mm) minimum, upper case, sans serif or simple serif type and shall be accompanied with Grade 2 Braille. Raised characters shall be at least 5/8 in (16 mm) high, but no higher than 2 in (50 mm). Pictograms shall be accompanied by the equivalent verbal description placed directly below the pictogram. The border dimension of the pictogram shall be 6 in (152 mm) minimum in height. **(See Door Schedule - if not shown provide 20 letter characters per room sign, the Supplier will be required to meet with the Owner for exact wording for all room**

**signs before preparation of the shop drawing submittal to the Architect for approval.)**

1. Tactile characters on signs shall be located 48 inches (1220 mm) minimum above the finish floor or ground surface, measured from the baseline of the lowest tactile character and 60 inches (1525 mm) maximum above the finish floor or ground surface, measured from the baseline of the highest tactile character. Where a tactile sign is provided at a door, the sign shall be located alongside the door at the latch side. Where a tactile sign is provided at double doors with one active leaf, the sign shall be located on the inactive leaf. Where a tactile sign is provided at double doors with two active leaves, the sign shall be located to the right of the right hand door. Where there is no wall space at the latch side of a single door or at the right side of double doors, signs shall be located on the nearest adjacent wall. Signs containing tactile characters shall be located so that a clear floor space of 18 inches (455 mm) minimum by 18 inches (455 mm) minimum, centered on the tactile characters, is provided beyond the arc of any door swing between the closed position and 45 degree open position. Mounting devices shall be concealed.

Storm Shelter Signage: Provide 11" x 8 1/2" high laminated plastic with raised lettering complying with the Americans with Disabilities Act (ADA), color as selected by the Architect. Use International Symbols of accessibility for identifying facilities as accessible. Letters and numerals shall be raised 1/32 in (0.8 mm) minimum, upper case, sans serif or simple serif type and shall be accompanied with Grade 2 Braille. Raised characters shall be at least 5/8 in (16 mm) high, but no higher than 2 in (50 mm). Pictograms shall be accompanied by the equivalent verbal description placed directly below the pictogram. Supply letter characters per sign as **indicated on the Life Safety Plan**, the Supplier will be required to meet with the Architect to verify the exact wording for all storm shelter signs before preparation of the shop drawing submittal to the Architect for approval.

1. Tactile characters on signs shall be located 48 inches (1220 mm) minimum above the finish floor or ground surface, measured from the baseline of the lowest tactile character and 60 inches (1525 mm) maximum above the finish floor or ground surface, measured from the baseline of the highest tactile character. **Mount signs at locations shown on the Life Safety Plan.** Mounting devices shall be concealed.

Occupancy Sign: Provide 6" x 8" high laminated plastic with raised lettering complying color as selected by the Architect. Letters and numerals shall be raised 1/32 in (0.8 mm) minimum, upper case, sans serif or simple serif type. Raised characters shall be at least 5/8 in (16 mm) high, but no higher than 2 in (50 mm).



## ARCHITECTURAL SIGNAGE

Plaque: Provide 24" high x 30" wide, cast aluminum bronze of standard alloy, hand tooled and chased, with raised letters and border, satin finish, and background pebbled finish and oxidized to a darker finish. Casting to be free of pits and blowholes, square and true with no warping. Border style to be single line, letters to be flat face classic design.

Cast Metal Letters: Provide standard cast aluminum letters for exterior architectural signage shown on drawings and as follows:

1. Building Signage: Provide full size sample prior to manufacture of all letters. Mounting shall be projected mount without collars set in adhesive. Color shall be anodized aluminum. Style of letter shall be upper case 15" high, 1 1/4" deep, "Arial Bold" font to read as follows:
  - a. **"SCIENCE AND BAND BUILDING"**

## FABRICATION:

General: Fabricate signs to comply with requirements indicated including, dimensions, design and details, and quality, thickness and finish of materials. Use materials and shapes of sufficient thickness, with reinforcing, if needed, to produce sufficient flatness, free of "oil canning", and to impart sufficient strength for size, design and application indicated.

## PART 3 – EXECUTION

### INSTALLATION:

Install units plumb and level, in locations and with mounting shown. Securely attach to the supporting structure with concealed fasteners, in accordance with the manufacturer's installation instructions.

### CLEANING AND PROTECTION:

At completion of the installation, clean surfaces in accordance with the manufacturer's instructions. Protect units from damage until acceptance by the Owner.

END OF SECTION 10410

## SECTION 10520 - FIRE EXTINGUISHERS, CABINETS AND ACCESSORIES

### PART 1 - GENERAL

#### RELATED DOCUMENTS:

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

#### DESCRIPTION OF WORK:

Definition: "Fire extinguishers" in this section refers to units which can be hand-carried as opposed to those which are equipped with wheels or to fixed fire extinguishing systems, unless otherwise indicated. Type of products in this section include:

1. Fire extinguishers.
2. Fire extinguisher cabinets.

UL-Listed Products: Provide new portable fire extinguishers which are UL-listed and bear UL "Listing Mark" for type, rating, and classification of extinguisher indicated.

FM Listed Products: Provide new portable fire extinguishers which are approved by Factory Mutual Research Corporation for type, rating, and classification of extinguisher indicated and carry appropriate FM marking.

#### SUBMITTALS:

Product Data: Submit manufacturer's technical data and installation instructions for all portable fire extinguishers required. For fire extinguisher cabinets include roughing-in dimensions, and details showing mounting methods, relationships to surrounding construction, door hardware, cabinet type and materials, trim style and door construction, style and materials. Where color selections by Architect is required include color charts showing full range of manufacturer's standard colors and designs available.

### PART 2 – PRODUCTS

Manufacturers: The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:

J.L. Industries.  
Larsen's Mfg. Co.  
Modern Metal Products

Equal products of other manufacturers may be used in the work provided such products have been approved by the Architect, not less than five (5) days prior to scheduled bid opening.

#### FIRE EXTINGUISHER CABINETS:

General: Provide fire extinguisher cabinets (FEC) where indicated, of suitable size for housing fire extinguishers of types and capacities indicated.

Construction: Manufacturer's standard enameled steel box, with trim, frame, door and hardware to suit cabinet type, trim style, and door style indicated. Weld all joints and grind smooth. Miter and weld perimeter door frames.

Cabinet Type: Suitable for mounting conditions indicated, of the following types:

1. Semi-Recessed: Cabinet box (tub) fire rated, semi-recessed in walls of sufficient depth to suit style of trim indicated. Cabinets located in corridors shall not protrude into the hall way more than 2-1/2".

Trim Style: Fabricate trim in one piece with corners mitered, welded and ground smooth.

1. Return Trim: For installation in walls where surface of surrounding wall finishes slightly back of exterior finished surface of frame and door of fire extinguisher cabinet, with overlapping trim attached to cabinet. Return trim shall be 2-1/2" deep with rolled trim.

Model equal to J. L. Industries Ambassador Steel

1. Model #1017 at non-rated walls with inside dimensions 24" x 10 1/2" x 6" Deep with F Door.
2. Model 1017FX at rated walls with inside dimensions 26 5/16" x 12 13/16" x 4" Deep with F Door.

Door Material and Construction: Manufacturer's standard door construction, of material indicated, coordinated with cabinet types and trim styles selected.

1. Enameled Steel: Manufacturer's standard finish, hollow steel door construction with tubular stiles and rails.

Door Style: Manufacturer's standard design as indicated below.

1. Full-Acrylic Panel: 1/4" thick clear acrylic.

Door Hardware: Provide manufacturer's standard door operating hardware of proper type for cabinet type, trim style, and door material and style indicated. Provide either lever handle with cam action latch, or door pull, exposed or concealed, and friction latch. Provide concealed or continuous type hinge permitting door to open 180°.

#### FACTORY FINISHING OF FIRE EXTINGUISHER CABINETS:

General: Comply with NAAMM "Metal Finishes Manual" for finish designations and application recommendations except as otherwise indicated. Apply finishes in factory after products are assembled. Protect cabinets with plastic or paper covering, prior to shipment.

#### Painted Finishes:

Preparation: Clean surfaces of dirt, grease, and loose rust or mill scale. Apply finish to all surfaces of fabricated and assembled units, whether exposed or concealed when installed, except those surfaces specified to receive another finish.

Baked Enamel Finish: Immediately after cleaning and pretreatment, apply manufacturer's standard baked enamel coating.

1. Provide colors or color matches as indicated or, if not indicated, as selected by Architect from manufacturer's standard colors.

#### FIRE EXTINGUISHERS:

General: Provide fire extinguishers for each extinguisher cabinet indicated, in colors and finishes selected by Architect from manufacturer's standard which comply with requirements of governing authorities.

1. Abbreviations indicated below to identify extinguisher types related to UL classification and rating system and not, necessarily, to type and amount of extinguishing material contained in extinguisher.

Multi-Purpose Dry Chemical Type (4A-80BC-FE): UL-rated 4-A; 80-BC, 10 lb. nominal capacity, in enameled steel container, for Class A, Class B and Class C fires, equal to Cosmic 10E by J. L. Industries. "Start-Up Tags" for each fire extinguisher must be provided and approved by Local Fire Department before Final Inspection.

Cooking Media Wet Chemical: Equal to Saturn Extinguishers by J. L. Industries, Class K Wet Chemical. Low "pH" potassium acetate solution is discharged in a fine mist that provides excellent range while preventing splashing and creating an effective saponification foam-type blanket necessary for suppressing liquid cooking media fires. Stainless steel cylinder with protective nozzle tip orifice seal and non-metallic nozzle tip finger guard. Industry standard horn and nozzle design. Name plate shows only the class "K" symbol. Capacity: 6 liter (1.8 gallon), 2.-1/2 gallon.

## PART 3 – EXECUTION

### INSTALLATION:

Install items included in this section in locations and at mounting heights indicated, or if not indicated, at heights to comply with applicable regulations of governing authorities.

1. Prepare recesses in walls for fire extinguisher cabinets as required by type and size of cabinet and style of trim and to comply with manufacturer's instructions.
2. Securely fasten mounting brackets and fire extinguisher to structure, square and plumb, to comply with manufacturer's instructions.
3. Where exact location of surface-mounted cabinets and bracket-mounted fire extinguishers is not indicated, locate as directed by Architect.

### IDENTIFICATION:

Identify fire extinguisher in cabinet with lettering spelling "FIRE EXTINGUISHER" painted on door by silk-screen process. Provide lettering on door as indicated, or if not indicated, as selected by Architect from manufacturer's standard letter sizes, styles, colors and layouts.

END OF SECTION 10520

## SECTION 10530 - FIRST AID CABINETS AND SAFETY KITS

### PART 1 - GENERAL

#### RELATED DOCUMENTS:

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

#### DESCRIPTION OF WORK:

“First Aid Cabinets” refer to units which are wall surface mounted with first aid/burn kits enclosed **(2 required)**.

Type of products in this section include:

1. First aid cabinets
2. Safety kits

#### SUBMITTALS:

Product Data: Submit manufacturer's technical data and installation instructions. Include roughing-in dimensions, and details showing mounting methods, relationships to surrounding construction, door hardware, cabinet type and materials, trim style and door construction, style and materials. Include color charts showing full range of manufacturer's standard colors and designs available.

### PART 2 – PRODUCTS

Manufacturers: The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:

Equal to American First Aid Kits, 200+ Person / Industrial First Aid Station with pocket liner / Wall Mountable, Product code: 249-O/P-200

Equal products of other manufacturers may be used in the work provided such products have been approved by the Architect, not less than five (5) days prior to scheduled bid opening.

## FIRST AID CABINETS AND KITS:

General: Provide first aid cabinets of suitable size for housing safety kits of types and capacities as follows:

Cabinets shall consist of the following safety aids:

1. Description: 5 Shelf Industrial First Aid Station with a pocket liner. This 5-shelf, 1720pc industrial first aid station serves 200 + people. Meets all of the OSHA and ANSI recommendations with refill requirements.

2. Contents:

Qty: Item:

1	I-435: Antacid tablets, (125) 2-pks
1	I-415: Non-aspirin tablets, (125) 2-pks
1	I-427: Extra-strength pain reliever, (125) 2-pks
1	H-410: Aspirin tablets, (50) 2-pks
1	G-155: 3/4"x3" Adhesive plastic bandages, 100/bx
1	G-122: 1"x3" Fabric bandages, 100/bx
1	G-124: Knuckle fabric bandages, 40/bx
1	G-126: Fingertip fabric bandages, 40/bx
1	G-128: Fingertip fabric bandages, large, 25/bx
2	B-204: 2"x4.1 yd. Conforming gauze roll bandages, 2/bx
1	B-207: 4"x4" Gauze dressing pads, 4/bx
1	3"x5 yd. Cohesive elastic bandage wrap
1	M-270: Super Stop™ bandage
1	B-518: Triangular sling/bandage, 1/bx
1	G-532: Exam quality gloves, 5 pr/bx
1	H-305: Alcohol cleansing pads, 100/bx
1	B-503: 4"x5" Instant cold compress, 1/bx
1	M-564-E: 6"x9" Instant cold compress, 1/bx
1	SL-109: 2"x4" Elbow & knee plastic bandages, 25/bx
1	M-5064: 3" Cotton tipped applicators, 100/vial
1	I-228: 24 - 2"x2", 24 - 3"x3" Gauze dressing pads, 48/bx
1	M-701-NIA: Eye wash, 4 oz.
1	M-704-NIA: Eye wash solution, 8 oz.
1	M-707: Redness reliever eye drops, 1/2 oz.
1	M-528: Antiseptic spray, 3 oz.
1	M-531: Burn spray, 3 oz.
1	M-527: Spray on bandage, 3 oz.
1	M-583: 5-3/4" Deluxe scissors - stainless steel
1	M-584: 4" Tweezers, plastic
1	M-660: 2"x5 yd. 3-Cut first aid tape
1	H-307: Antiseptic cleansing wipes (sting free), 50/bx
1	G-310: Povidone-iodine infection control wipes, 50/bx
1	B-718: 4 Sterile, oval, gauze eye pads, 1/2"x5 yd. first aid tape, 1/bx

- 1 G-231: 2"x3" Non-stick pads with adhesive edges, 50/bx
- 1 B-504: CPR Pack: 1 Rescue Breather™ CPR one-way valve  
faceshield, 2 large latex gloves and 3 antiseptic wipes (sting free)
- 1 A-5009: Ammonia inhalants, 10/bx
- 1 A-151: Medium butterfly wound closures, 10/bx
- 2 AN-205: 32 sq. in. Absorbent gauze compress, 1/bx
- 1 G-486: Hydrocortisone cream, 1.0%, 1.5 gm pack, 25/bx
- 1 G-469: Burn relief packs, 3.5 gm pack, 25/bx
- 1 M-5068: 22-pocket, vinyl liner

Cabinet Construction: Manufacturer's standard enameled steel box, with trim, frame, door and hardware to suit cabinet type, trim style, and door style indicated. Weld all joints and grind smooth. Miter and weld perimeter door frames.

Cabinet Type: Suitable for surface mounting conditions.

Door Material and Construction: Manufacturer's standard door construction, of material indicated, coordinated with cabinet types with label emboss.

Door Hardware: Provide manufacturer's standard door operating hardware of proper type for cabinet type, trim style, and door material and style indicated. Provide either lever handle with cam action latch, or door pull, exposed or concealed, and friction latch. Provide concealed or continuous type hinge permitting door to open 180°.

### PART 3 – EXECUTION

#### INSTALLATION:

Install items included in this section in locations and at mounting heights indicated, or if not indicated, at locations and heights to comply with applicable regulations of governing authorities and ADA.

1. Securely fasten mounting brackets to structure, square and plumb, to comply with manufacturer's instructions.
2. Where exact location of surface-mounted cabinets with other trades and as directed by Architect.

#### IDENTIFICATION:

Identify first aid kit in cabinet with lettering spelling "FIRST AID" painted on door.

END OF SECTION 10530



## SECTION 10800 - TOILET ACCESSORIES

### PART 1 – GENERAL

#### GENERAL

#### RELATED DOCUMENTS:

Drawings and general provisions of contract including General and Supplementary Conditions and Division 1 Specification sections apply to work of this section.

#### DESCRIPTION OF WORK:

Extent of each type of toilet accessory is indicated on drawings and schedules.

Types of toilet accessories required include the following:

#### **Furnished and Installed by the Contractor:**

1. Grab Bars
2. Mirror Units
3. Soap Dispensers
4. Toilet Tissue Dispensers
5. Paper Towel Dispensers - Roll Type

#### QUALITY ASSURANCE:

Inserts and Anchorages: Furnish inserts and anchoring devices which must be set in concrete or built into masonry; coordinate delivery with other work to avoid delay.

Accessory Locations: Coordinate accessory locations with other work to avoid interference and to assure proper operation and servicing of accessory units.

Products: Provide products of same manufacturer for each type of accessory unit and for units exposed in same areas, unless otherwise acceptable to Architect.

#### SUBMITTALS:

Product Data: Submit manufacturer's technical data and installation instructions for each toilet accessory.

### PART 2 – PRODUCTS

The following manufacturer's products have been used to establish minimum standards for materials, workmanship and function.

Grab Bars: (Where shown on Plans) with Safety-Grip Finish.

#8122	Bradley Corporation
#3200P	Series ASI
#B6806.99	Bobrick

Mirror Units: One over each lavatory

#780-18" x 38"	Bradley
#B290-18" x 36"	Bobrick
#0600-18" x 36"	ASI

Soap Dispensers: Wall Mounted over each sink (Minimum One at each sink)

#B-2112	Bobrick
#0-343	ASI
#6562	Bradley

Toilet Tissue Dispensers – Roll Type: (Minimum One at each water closet)

#5425	Bradley
#0040	ASI

Paper Towel Dispensers – Wall Mounted (Minimum One at each sink)  
Roll Type (Surface Mounted):

#8522	Accessory Specialties, Inc.
#2491	Bradley
#U199A	AJ washroom accessories
#8522	ASI

Equal products of other manufacturers may be used in the work provided such products have been approved by the Architect not less than five (10) days prior to scheduled bid opening.

#### MATERIALS, GENERAL:

Stainless Steel: AISI Type 302/304, with polished No. 4 finish, 22 gage minimum, unless otherwise indicated.

Mirror Units: Mirror glass shall be FS DD-G-451, Type I, Class I, Quality q2, 1/4" thick, with silver coating, copper protective coating, and non-metallic paint coating complying with FS DD-M-411. Mirror shall be provided in stainless steel frames.

Fasteners: Screws, bolts, and other devices of same material as accessory unit or of galvanized steel where concealed.

#### FABRICATION:

General: Stamped names or labels on exposed faces of toilet accessory units are not permitted, except where otherwise indicated; in obtrusive labels on surfaces not exposed to view are acceptable. Where locks are required for a particular type of toilet accessory, provide same keying throughout project. Furnish two keys for each lock.

Surface Mounted Toilet Accessories General: Except where otherwise indicated, fabricate units with tight seams and joints, exposed edges rolled. Hang doors or access panels with continuous stainless steel piano hinge. Provide concealed anchorage wherever possible.

Recessed Toilet Accessories, General: Except where otherwise indicated, fabricate units of all welded construction, without mitered corners. Hang doors or access panels with full-length stainless steel piano hinge. Provide anchorage which is fully concealed when unit is closed.

### PART 3 – EXECUTION

#### INSTALLATION:

Install toilet accessory units in accordance with manufacturer's instructions, using fasteners which are appropriate to substrate and recommended by manufacturer of unit. Install units plumb and level, firmly anchored in locations and at heights indicated.

#### ADJUSTING AND CLEANING:

Adjust toilet accessories for proper operation and verify that mechanisms function smoothly. Replace damaged or defective items.

Clean and polish all exposed surfaces after removing labels and protective coatings.

END OF SECTION 10800

## SECTION 12345 - WOOD CASEWORK

### PART 1 - GENERAL

Summary: The following specification is written to provide the level of design expectation of the owner and architect in regards to the quality/functionality of the product and installation for the wood casework.

#### 1.1 SECTION INCLUDES

- A. Furniture: Provide and install all wood casework, furniture and benches; which may include, but is not limited to: wood casework, countertops, reagent shelves, tables, standards, filler panels, scribes, knee space panels, accessories, utility space framing, utility space closure panels between base cabinets and at exposed ends of utility spaces, laboratory sink cutouts and sinks, cup sinks, cup drains, strainers, overflows, sink outlets, miscellaneous wall shelving, overhead service carrier or tiles and miscellaneous items of equipment as listed in the specifications or as shown on drawings. Work includes all laboratory furniture depicted on drawings or listed in these specifications unless otherwise noted as "Not in Contract" (NIC) within the drawings, equipment schedule or said specifications.
- B. Plumbing Fixtures: Furnish, deliver and install the fixtures at service outlets that are either listed in these specifications, depicted in drawings or identified in the equipment schedule as being affixed to laboratory casework. Installation is to be "hand tight" only, final connection is by others.
- C. Electrical Service Fixtures: Furnish, deliver and install the electrical service fixtures that are either listed in these specifications, depicted in drawings or identified in the equipment schedule as being affixed to laboratory casework. Installation is to be "hand tight" only, final connection is by others.
- D. Sink Bowls and Cup-sinks Integral with Countertops: Furnish, deliver and install all sinks bowls, cup-sinks and tail pieces (if shown or specified) at locations that are listed in these specifications, depicted in drawings, or identified in the equipment schedule. Sinks and cup- sinks are to be installed within the countertop with final connection to the drain piping system by others

#### 1.2 RELATED SECTIONS

- A. Division 06 "Rough Carpentry" for blocking within walls to adequately support casework
- B. Division 12, "Countertops"
- C. Division 15 "Plumbing Fixtures". Plumbing contractor shall provide WaterSaver model AP3600 thermostatic mixing valve at eyewash/drench hose locations where shown on plans. Mixing valve is recommended to provide tepid water as provided by ANSI Z358.1-2014 and will not be provided by casework contractor.
- D. Related Work to be Performed by Others:
  - a. Final connection to service lines of all plumbing and electrical fixtures attached to laboratory casework or furniture

#### 1.3 REFERENCES

- A. ANSI/Hardwood Plywood Veneer Association Manual
- B. ANSI-A135: for all hardboard.
- C. ANSI-A161.2-1998: performance for fabricated high-pressure decorative laminate countertops.
- D. ANSI-A208.1-2009: for Mat-Formed Wood Particleboard Grade M-3
- E. ANSI-A112.18.1m-1989: for fixtures and water service.
- F. ANSI Z359.1-1998: for safety eyewashes and equipment.
- G. ASSE Standard 1001: for vacuum breakers
- H. ASTM B88 and ANSI/NSF 61: for plumbing.
- I. AWI Standards 8th Edition – 2003 Sections 400A-T-12, 400B-T10 and 1600-T-11: for woodwork standards.
- J. BHMA A156.9: for Grade-1 hinge requirements.
- K. CAN/CSA b.125.M89 Canadian Standards: for fixtures and water service.
- L. National Electrical Code, Article 352-B: for surface nonmetallic raceway.
- M. NEMA 3 LD – 2005: for performance requirements of high pressure laminates.
- N. SEFA 8 Recommended practices for cabinet construction.
- O. UL-5A: for raceway listed for electrical wiring.
- P. UL 94 V-0: for raceway systems

#### 1.4 DEFINITIONS

- A. “Barrel Hinge” is a hinge composed of two plates attached that are attached to abutting surface.
- B. “Concealed hinge” is any hinge that has no components visible from the outside of the cabinet.
- C. “Concealed Portions of Casework” surfaces that are not visible after installation; Bottoms of cabinets are less than 30 inches above finished floor; Tops of cabinets are 72 inches or more above finished floor (and are not visible from an upper level); Stretchers, blocking and/or components that are concealed by drawers; Corners created by tall, wall, or base cabinets and which are non-accessible. NOTE: For the purpose of maintaining modular casework all cabinet ends will be considered exposed.
- D. “Eased” is a process of providing a slight radius on door and drawer fronts of a cabinet.
- E. “Exposed surfaces” are surfaces that are visible when: Drawer fronts and doors are closed; Cabinets and shelving are open or behind clear glass doors; Bottoms of cabinets are seen 48 inches or more above the finished floor; Tops of cabinets are seen below 72 inches above finished floor, or are visible from an upper floor or raised area after installation (Please see Modular Casework note under C. above)
- F. “False Fronts” are nonfunctional fronts attached to particular units that mimic drawer box fronts to create an uninterrupted visual image of an elevation.
- G. “Reveal Overlay” is casework design that requires the reveal of 1/8” between all individual door and drawer components within a cabinet. There is a 3/8” reveal at the edge of door and drawer components to the edge of the cabinet to maintain a 3/4” reveal on adjacent cabinets.
- H. “Laboratory Casework Contractor/Manufacturer” is defined as the manufacturer and/or manufacturer’s representative that is to provide and install the laboratory casework, equipment, and accessories listed under the specifications, laboratory equipment schedule and/or illustrated on drawings.
- I. “NAUF” is the term used for “no added urea formaldehyde”. This is required when no part of the wood product or any product on the entire can contain added urea formaldehyde in the production of the products. This is critical to LEED point criteria

and if specified must be followed explicitly or complete building failure will occur.

- J. "Reveal" is the measurement between individual door and drawer components on the face of a cabinet.
- K. "Semi-exposed" surfaces that are visible when: Opaque doors are open or drawers are extended; Bottoms of cabinets more than 30 inches and less than 42 inches above finished floor.
- L. "Service Fixtures" are laboratory gas, air, and vacuum cocks; hot, cold and reagent water faucets; remote control valves, electrical receptacles (with necessary flush mounting hardware), fluorescent and/or incandescent light fixtures, light switches and/or motor switches for fume hoods and other items which serve as an operational part of the equipment.
- M. "Service Lines" are the necessary piping and drain lines for laboratory gas, air and vacuum as well as hot, cold and reagent grade water that conveys the respective services from building roughing through floors or walls through equipment to the previously defined service fixtures. Also includes conduits, junction boxes, conduit fittings, wire disconnect switches and fuse or circuit breakers necessary to conduct electrical services from building roughing in floors or walls through equipment to service fixtures.

## 1.5 SYSTEM DESCRIPTION

- A. Reveal overlay with 1/8" reveal between intra-cabinet doors and drawers and 3/8" reveal at cabinet edge for offset of the hinge around the door. All door and drawer fronts will be adjusted to maintain these tolerances.
- B. Doors and drawer fronts are to be slightly eased at all edges.
- C. No exposed fasteners are allowed without prior approval of the architect or lab planner.
- D. Cabinet elevations will be built in symmetrical sizes as required to fill the area.
- E. Maximum filler size is 4" and must be balanced and on each end of wall to wall elevations.

## 1.6 SUBMITTALS

- A. Shop Drawings:
  - a. Comply with Division 1
  - b. Submit 3 sets of laser quality, 11x17 shop drawings consisting of:
    - i. Finish, hardware, construction options selection sheet
    - ii. Small scale floor plan showing casework in relation to the building.
    - iii. Large scale elevations and plan views.
    - iv. Cross-sections; service runs; locations of blocking within walls (blocking is done by others); rough-in requirements and, sink centerlines.
  - c. Drawings should include data and details for construction of the laboratory casework as well as information regarding the name, quantity, type and construction of materials (such as hardware, gauges, etc.), that will be used to complete the project.
  - d. The manufacturer or purchaser of any equipment prior to approval by the owner's representative will be undertaken at the manufacturer's risk.
  - e. Field Measurements: In instances in which casework is indicated to fit to

other construction, dimensions are to be verified by field measurements before fabrication and reflected on shop drawings.

B. Samples:

- a. Sample cabinets upon request: 1 base and/or 1 wall cabinet as selected by owner/architect
- b. Stain and Finish Samples
  - i. A minimum of five (5) standard manufacturer's samples, constructed of the same material from which the casework will be constructed, stained and clearly identified, should be submitted to the architect for color selection.
  - ii. Stain and finish samples will be retained by the owner's representative.

## 1.7 QUALITY ASSURANCE

- A. Design Data/Test Reports: Manufacturer shall submit test data and design criteria which are in compliance with SEFA 8 W, "Laboratory Furniture – Casework, Shelving and Tables – Recommended practices." Testing of safety devices and performance criteria shall be performed by a 3rd party validator.
- B. Certificates: All certifications required in the specifications should be submitted with the original submittal package under separate cover. Certificates must be provided with the signature of a qualified individual of the supplier.
- C. Qualification of Bidder/Manufacturer: The following list of information should be provided to the Architect at least ten (10) days prior to the bid opening:
  - a. List of manufacturing facilities
  - b. A list of five (5) installations of comparable stature completed within the past 3 years
- D. Regulatory Requirements
  - a. Reference Standard: The ensuing specifications are based on the design of CiF Lab Solutions M-Line Series wood casework.
  - b. Source Limitations: All casework, including countertops, sinks, service fittings and accessories, should be obtained from a single source to ensure consistency in project delivery.
- E. Mock-Ups
  - a. Area mockups shall be as indicated on the shop drawings. Mockup areas must be priced for disassembly and reassembly and used within the project.

## 1.8 DELIVERY, STORAGE AND HANDLING

- A. Packaging, Shipping, Handling and Unloading Packaging: Products should have packaging adequate enough to protect finished surfaces from soiling or damage during shipping, delivery and installation.
- B. Delivery: Casework delivery should only take place after painting, utility rough-ins and related activities are completed that could otherwise damage, soil or deteriorate casework in installation areas.
- C. Handling: Care, such as the use of proper moving equipment, experienced movers, etc., should be used at all times to avoid damaging the casework. Until installation takes place, any wrapping, insulation or other method of protection applied to products from the factory should be left in place to avoid accidental damage.

- D. Acceptance at Site: Casework will not be delivered or installed until the conditions specified under Part 3, Installation section of this document have been met.
- E. Storage: Casework should be stored in the area of installation. If, prior to installation, it is necessary for casework to be temporarily stored in an area other than the installation area, the environmental conditions shall meet the environmental requirements specified under the Project Site Conditions article of this section.
- F. Waste Management and Disposal: The supplier of the laboratory casework is responsible for removing any waste or refuse resulting from the installation of, or work pertaining to laboratory casework; thereby leaving the project site clean and free of debris. Trash container/s to be provided by others.

## 1.9 PROJECT SITE CONDITIONS

- A. Building must be enclosed (windows and doors sealed and weather-tight);
- B. An operational HVAC system that maintains temperature and humidity at occupancy levels must
- C. be in place; Relative humidity must be regulated and stable between 25% and 55% per AWI standards before products are brought on site, throughout project completion and with the site moving forward while the building is in use by the owner.
- D. Ceiling, overhead ductwork and lighting must be installed;
- E. Site must be free of any further construction such as "wet work."
- F. Required backing and reinforcements must be installed accurately and the project must be ready for casework installation.

## 1.10 WARRANTY

- A. Furnish a written warranty that Work performed under this Section shall remain free from defects as to materials and workmanship for a period of three (3) years from date of acceptance. Defects in materials and workmanship that may develop within this time are to be replaced without cost or expense to the Owner. Defects include, but are not limited to:
  - a. Ruptured, cracked, or peeling veneer
  - b. Discoloration or lack of finish integrity
  - c. De-lamination of components or edge banding
  - d. Slippage, shift, or failure of attachment to wall, floor, or ceiling
  - e. Warping or unloaded deflection of components
  - f. Failure of hardware
- B. The warranty specifically does not cover any product or hardware, which has been incorrectly installed, including poor climate conditions, exposed to excessive loads or abuse.
- C. All non-casework items supplied, but not manufactured at CiF Lab Solutions shall be covered under the original manufacturer's warranty.



## PART 2– PRODUCTS

### 2.1 MANUFACTURERS

- A. The following manufacturers' products have been used to establish minimum, standards for materials, workmanship and function:  
Basis-of-Design Product: CiF Lab Solutions 53 Courtland Avenue, Vaughan, ON, Canada L4K3T2
- B. Equal products of other manufacturers may be used in the work provided such products have been approved by the Architect, not less than five (5) days prior to scheduled bid opening.  
Substitution Limitations:
  - a. Substitutions will be considered only when other manufacturers submit substitution requests in accordance with procurement substitution and/or substitution procedures, or provide a comparable product with the following support information detailed below:
  - b. Written documentation stating specification compliance regarding construction, materials, and standard of quality and manufacturing techniques.
  - c. Note all deviations to the drawings and/or specifications in writing.
  - d. Provide the Architect with a full-scale base cabinet not less than ten days prior to bid date. The sample shall represent typical construction and materials for the product the casework manufacturer proposes, meeting the quality standards set forth by this specification. The sample may be impounded by the owner and retained until completion of the casework installation.
  - e. The owner, or its designated representative, reserves the right to reject any proposal that in his opinion fails to meet the criteria established by this specification. Such a decision shall be final.
- C. Approved Equals
  - a. Sheldon Labs
  - b. Kewaunee Scientific
- D. Source Limitations: Obtain laboratory casework from single source from single manufacturer unless otherwise indicated.

### 2.2 MATERIALS

- 1. Wood Casework:
  - A. Solid Lumber Used:
    - a. All hardwoods shall be carefully and thoroughly air-dried, and then kiln dried to a moisture content of 6-9 percent before use.
  - B. Materials for construction for Casework Body, Interior shelving and Doors/Drawer Heads:
    - a. Cabinet ends, bottoms, shelves and backs shall be fabricated of premium ¾" MDF board. Components of particleboard, lumber or other materials will not be acceptable.
    - b. Doors and drawer fronts shall be fabricated of premium ¾" MDF board.

- c. Backs of all open or glazed wall and tall cabinets shall be ½" MDF board. Backs of all semi-exposed wall and tall cabinets will be ½" thermally fused melamine.
- d. Cabinet liners, vinyl covered boards, foils or other similar materials are not acceptable on any components.
- e. Glass shall be tempered, 6mm thick for unframed doors and 5mm thick for framed doors.

#### C. Hardware

- a. Pulls shall be nominal 4" wire type. Finish shall be brushed chrome. Drawers over 24" wide to receive two pulls. Mount drawer pulls horizontally.
- b. Hinges shall be institutional type 2 ¾", 5-knuckle steel hinge, wrap around design. Two hinges on doors up to 36" in height, three hinges on doors over 36" in height, four hinges on doors over 60" in height
- c. Door catches: Adjustable type, spring activated nylon roller catches.
- d. Note: Door catches not required with the 3 Knuckle self-closing hinges or concealed self-closing hinges
- e. Elbow catches shall be spring actuated and come complete with strike plate. Provided where locks occur in hinged double door units.
- f. Drawer slides shall be full extension, ball bearing type equal to Accuride model#3832, full extension series. File drawer slides shall be equal to the Accuride model #4034, 150lb, full extension.
- g. Locks: 5 disc tumbler cam locks with offset cam and removable core. Exposed face chrome plated. Keying: keyed alike or in groups per room with master key.
- h. Framed Glass Hinged Doors: Locks shall be as specified in x. and xi. above. Tempered Glass.
- i. Adjustable seismic shelf supports shall be double pin, plastic locking type, able to accommodate both ¾" and 1" thick shelves.

#### D. Countertops

- a. Epoxy Resin Countertops: Countertops are to be flat, black, 1" thick with beveled, rounded top, front edge and all corners, with 1" thick, 4" high applied backsplash/curbs (unless otherwise noted), constructed of the same material and located at the rear of tops and on end returns. Ends of countertop to be square. Backsplash/curbs shall be bonded to top surface to form a square joint. Joints are to be sealed water-tight with corrosion resistant could. Front overhangs should be equal to 1" at cabinet fronts and side overhangs at exposed units shall be ¾", with a drip groove on the underside ½" from the

edge. Tops should be manufactured of one piece and cut to the maximum lengths possible. Fabricate with factory cutouts for sinks and with butt joints assembled with silicone.

#### E. Sinks

- a. Molded Epoxy Resin Sinks: Sinks shall "drop-in" style with inside corners and bottoms covered for easy cleaning. Sinks shall be of epoxy resin modified and compounded with selected materials and designed to provide the same performance requirements as specified for the epoxy resin countertops. Sinks shall be non-glaring black color. Epoxy sinks furnished with polypropylene sink outlets.
- b. Sink Sizes: Sizes shall be as designated on the drawings.
- c. Basis of Design for ADA designated sink: Synergy Sink by Sheldon Laboratory Systems. The *only* acceptable approved equal is Durcon epoxy sink model #A26 ADA sink. Refer to "F" under 2.6 Technical Products for more detail.

ADA sink designated in lab shall come equipped with a deck flange for countertop mounting of dual purpose eyewash/drench hose. Flange shall have handle locator guide to position spray heads and handle facing forward at all times. Unit shall have (2) polypropylene GS-Plus™ spray heads mounted side-by-side with integral "flip-top" dust covers, internal flow control and filter to remove impurities from water flow. Hose shall be 8 feet reinforced PVC, 300 PSI maximum working pressure. Valve shall be forged brass squeeze valve activated by stainless steel lever handle. Valve shall have replaceable stainless steel seat for exceptional durability. Locking clip shall engage when the handle is depressed, providing "hands-free" operation. Unit shall include ANSI compliant sign.

1) Performance: Unit shall be fully factory assembled and hydrostatically tested to meet or exceed ANSI Z358.1 – 2014, as both an eyewash and a drench hose.

2) Fixture: WaterSaver, model number EW1022; Watersaver AP3600 thermostatic mixing valve to be provided by plumbing contractor.

## 2.3 FABRICATION

#### A. Base Units

- a. Cabinet ends shall be  $\frac{3}{4}$ " MDF board.
- b. Front top rail:  $\frac{3}{4}$ " x 3  $\frac{3}{4}$ " MDF board, fastened to cabinet ends with fluted dowels.
- c. Rear top and bottom support rails:  $\frac{3}{4}$ " x 3  $\frac{3}{4}$ " MDF board, fastened to cabinet with fluted dowels.
- d. Toe space rail:  $\frac{3}{4}$ " x 4" MDF board fastened to cabinet ends with fluted dowels to form a 4" high x 2" deep toe space.
- e. Cabinet bottoms:  $\frac{3}{4}$ " MDF board set flush and fastened to cabinet ends with fluted dowels.
- f. Cabinet backs: Cabinet backs in exposed cabinets shall be fabricated of  $\frac{1}{2}$ "

MDF board. Cabinet backs in semi-exposed cabinets shall be fabricated of one-piece ¼" white tempered hardboard. Backs are not provided on drawer units.

- g. Vertical dividers: Full height dividers and half height dividers shall be 1 ½" MDF board secured to bottom, front top rail and rear top rail with dowels and screws.
- h. Adjustable shelves shall be set on double pin, plastic locking shelf supports at 1¼" spacing. Shelves shall be full depth in standard cupboards and in open units. Adjustable shelves on base cabinets 36" and smaller shall be ¾" thick. Adjustable shelves on cabinets over 36" wide shall be 1" thick.
- i. Drawer Construction: Drawer box back, front and sides to be of ½" Baltic Birch, 9 ply hardwood plywood and shall be finished with the same laboratory grade finish as applied to the cabinet. Use dovetail joinery on all four joints. Drawer bottom shall be ¼" white thermo-fused melamine faced MDF and shall be grooved into all four sides of the drawer box and glued into position. Drawer body will be affixed to drawer front by screws.
- j. Doors and drawer fronts shall be ¾" MDF board. Construction shall be full overlay.

#### B. Wall and Tall Cases

- a. Case ends: ¾" MDF board.
- b. Tops of wall and tall cases: 1" MDF board fastened to ends with fluted dowels
- c. Bottoms of wall cases: 1" MDF board fastened to cabinet ends with fluted dowels.
- d. Bottoms of tall cases: ¾" MDF board fastened to cabinet with fluted dowels.
- e. Exposed backs on wall and tall cabinets shall be ½" MDF board; semi-exposed backs shall be ½" melamine. Backs shall be stapled and glued into rebates on back edge of ends.
- f. Fixed center shelves on tall cases shall be 1" thick and shall be fastened to ends with
- g. fluted dowels.
- h. Adjustable shelves shall be set on steel pin type shelf supports at 1¼" spacing. Shelves shall be ¾ depth in standard cupboards and full depth in open units. Adjustable shelves on base cabinets 36" and smaller shall be ¾" thick. Adjustable shelves on cabinets over 36" wide shall be 1" thick.
- i. Adjustable shelves shall be set on double pin, plastic locking shelf supports at 1¼" spacing. Shelves shall be full depth in standard cupboards and in open units. Adjustable shelves on base cabinets 36" and smaller shall be ¾" thick. Adjustable shelves on cabinets over 36" wide shall be 1" thick.

#### C. Doors

##### Solid Doors

- a. Solid doors shall be ¾" MDF board. Construction shall be Reveal overlay. Doors shall be finished with a laboratory grade catalyzed vinyl finish.
- b. Provide two hinges on all doors up to 36" in height and a minimum of three hinges on doors exceeding this height.

## 2.4 FINISHES

### A. Casework Finish

- a. Casework shall be finished on all interior and exterior surfaces in a flat line; oven cured process, spraying a catalyzed vinyl coating especially formulated for laboratory casework and be acid/solvent resistant (System 7 Catalyzed Vinyl).
- b. Casework finish shall meet AWI Quality Standards Eighth Edition for Specialty Finishes
  - Premium Catalyzed Vinyl and SEFA 8-1999 CHEMICAL RESISTANCE SPECIFICATIONS. Manufacturers are to provide documentation to the architect of their finishes' compliance to the above.
- c. Apply a coat of sealer and two finish coats to surfaces. Thoroughly sand surfaces between coats. Maximum film build is 6 wet mils and (2.9-3.3) mils dry.
- d. Solids content to be minimum 35% by weight.
- e. Prior to finishing sand surfaces smooth, ensuring that they are free of dirt, defects, chatter and machine marks.
- f. Apply sealer and finish coats to all exposed and semi-exposed casework surfaces.
- g. Finish coat shall leave a smooth, clear, satin finish with consistent coloration.
- h. Finishes must pass the following tests or they will be rejected.
  - 1. 20 cycle Cold Check Test.
  - 2. Print Test ASTM D2091
  - 3. Moisture Resistance Test
  - 4. Impact Resistance Test
  - 5. Hot Water Test
  - 6. Chemical Resistance Test – ASTM D1308
- i. Paint Colors: As selected by architect from manufacturer's full range.

## 2.5 LABORATORY SERVICE FIXTURES AND FITTINGS

A. Vandal-Resistant Fittings: Provide vandal-resistant faucets and fittings specifically designed to prevent student damage and provide extra protection from student vandalism.

All service fittings shall conform to SEFA 7-2010, Recommended Practices for Laboratory Service Fittings, Para 14.0-14.3 for Vandal Resistant Fittings.

Each fitting shall resist turning, bending, breakage, and unintended disassembly through acts of vandalism or physical abuse.

B. Vandal-Resistant Construction features shall include: All threaded connections that will not require field service shall be secured with a suitable adhesive so as to be non-removable.

All goosenecks and spouts shall be constructed of heavy duty pipe or tubing that is sufficient to resist bending and breakage.

Faucet bodies and turret bases shall be provided with locking pins or other means to prevent the fixture from being turned on the worksurface.

Outlet fittings (such as aerators or serrated hose ends) shall either be of Vandal-resistant design or shall be secured in place with an adhesive. Index buttons shall be tamperproof.

Water fitting provided with serrated hose ends shall be furnished with vacuum breakers to prevent contamination of the potable water system through backflow or back-siphonage.

Fittings for laboratory gases shall be furnished with ball valves and shall also be provided with internal check valves to prevent backflow through the valve.

Water fittings shall have valve packing nuts secured with set screws. Integral Vacuum Breaker covers shall be secured with screws that may be removed only by maintenance personnel.

#### C. Gas Fixtures

Provide gas fittings in multiple service faucets forged brass lever handle, non-removable serrated hose end, and color coded index button.

#### D. Water Faucets and Valves:

Provide units that comply with SEFA 7 – 2010, Laboratory Service Fittings – Recommended Practices, and also complying with ANSI/ASME A112.18.1 – 2005 and certified by CSA International under CAN/CSA B.125.1 – 05.

Provide units fabricated from cast or forged brass unless otherwise indicated.

Provide fittings complete with threaded mounting shanks, locknuts, and washers. Include necessary flanges, escutcheons, extension rods, etc.

Provide units complying with ADA accessible requirements where indicated on Drawings.

One faucet shall be provided with 4" wrist-blade handles at ADA sinks.

All faucets shall be provided with aerators unless specifically noted to have serrated hose ends.

If serrated hose ends are required on water faucets, provide unit with vacuum breaker.

Water faucets shall have self-contained renewable compression valve units with stainless steel valve seats. Compression unit valve stem shall be sealed with molded TFE stem packing to prevent leakage. Provide color coded index buttons.

#### E. All Water and Gas Service Fixtures shall have Black Powder Coat Epoxy Finish.

#### F. Multiple Service Water/Gas Fixture Combination Faucets

##### a. Watersaver Faucet Co. No. VR5300WSA

- Combination Cold Water/Gas Fixture with Aerator
- Black powder coat epoxy finish

- Color coded nylon handles for cold water
- Vandal-resistant

G. Drain Fittings:

- a. Sink Fittings: Sinks shall be provided with 1-1/2" Dia. X 3" threaded Polypropylene Sink Outlet with locknut, removable disc strainer, and sink stopper.

H. Electrical Fixtures:

- a. Electrical fixtures that are a part of, or installed in the Lab Equipment shall be approved by the National Board of Underwriters and must conform to City and State Building Codes.
- b. Knock-out boxes when indicated in casework or casework aprons, shall be installed in the Lab Equipment.
- c. Receptacles shall be grounded type, 20-amp heavy duty industrial grade.

## 2.6 TECHNICAL PRODUCTS

General: The following equipment list is provided to accurately describe specific Technical Products shown on the drawings.

### A. INSTRUCTOR'S DEMONSTRATION DESK

96" L. x 31" W. x 36" H. Work top shall be 1" epoxy resin. Base cabinets include (1) sink cabinet, (1) seven drawer cabinet and (1) 24" knee space. Services include (1) VR5800WSA combination hot water/cold water/gas fixture; (1) G.F.I. duplex electrical outlet; (1) epoxy resin sink (16" X 16" X 18") I. D. with 1-1/2" sink outlet, strainer and stopper; (2) upright rod sockets in top; (1) upright rod assembly. Trap not included. Finished back shall be provided.

Instructor's demonstration desk shall come equipped with a deck flange for countertop mounting of dual purpose eyewash/drench hose. Flange shall have handle locator guide to position spray heads and handle facing forward at all times. Unit shall have (2) polypropylene GS-Plus™ spray heads mounted side-by-side with integral "flip-top" dust covers, internal flow control and filter to remove impurities from water flow. Hose shall be 8 feet reinforced PVC, 300 PSI maximum working pressure. Valve shall be forged brass squeeze valve activated by stainless steel lever handle. Valve shall have replaceable stainless steel seat for exceptional durability. Locking clip shall engage when the handle is depressed, providing "hands-free" operation. Unit shall include ANSI compliant sign.

- 1) Performance: Unit shall be fully factory assembled and hydrostatically tested to meet or exceed ANSI Z358.1 – 2014, as both an eyewash and a drench hose.
- 2) Fixture: WaterSaver, model number EW1022; Watersaver AP3600 thermostatic mixing valve to be provided by plumbing contractor.

### B. Student Utility Tables

Provide a quantity of fourteen (14) student tables measuring 60" L. x 30" W. x 36" H. Provide quantity of two (2) tables measuring 60" L. x 30" W. x 34" H. for ADA purposes. Hardwood fully framed with rails 3/4" X 4" with diagonal corner braces tenoned and screwed to inner face of rails. The corner braces shall be metal, grooved and screwed with four screws. Table legs shall be properly fitted into position and securely fastened to diagonal corner brace with nut, washer and 3-1/2" x 5/16 carriage bolt completely running through the leg providing a positive system whereby bolt can be tightened without depending upon screw holding power of the table legs. (NO other fastening method is approved) Legs shall be 2-1/4" square of solid laminated hardwood, thoroughly glued, and corners rounded. Legs shall be equipped with 7/16" grip ring stem caster with 4" soft rubber wheel. Caster break is a thread lock type. Top to be 1" epoxy resin.

C. SC8051 ACID STORAGE CABINET

31"W. x 36 5/8"H. x 20"D. Cabinet is constructed of one-inch (1") thick, high-density, 9-ply, exterior grade plywood finished with multiple coats of epoxy paint. Cabinet bottom constructed as a liquid-tight, two-inch (2") trough to contain accidental spills. Top is recessed to include a liquid-tight polypropylene tray. Tray will hold 3 gallons of spilled liquid and can be used as a dispensing area. Interior is fully lined with 1/8" thick polypropylene and all screws and fasteners are to be plastic. Cabinet has an interlocking door assembly, lock hasps and padlock with two keys' and one fixed shelf. The word "ACID" is printed on the cabinet in six-inch (6") red letters. Unit furnished with wooden door handle and four leveling feet. Cabinet complies with all O.S.H.A. and National Fire Protection Association standards. Capacity: (30) 2.5 liter or (90) 500ml bottles.

D. SC7131 FLAMMABLE STORAGE CABINET

43"W. x 44 5/8"H. x 18"D. Cabinet is constructed of one-inch (1") thick, high-density, 9-ply, exterior grade plywood finished with yellow epoxy paint (inside and out) and 10" x 10" hazard labels on the doors. Unit furnished with continuous piano-type hinges on doors, lock with two keys, two (2) adjustable shelves mounted on metal shelf standards and supports, and corrosion-resistant hardware. Cabinet floor constructed as a two-inch (2") liquid-tight trough to contain spillage. Cabinet complies with all O.S.H.A and National Fire Protection Association standards. Capacity: 45 gallons.

E. SAFETY GOGGLE CABINET

24-5/8" L. x 12" D. x 25-1/8" H. High gloss steel cabinet with steel interior has a capacity for (36) pairs of safety goggles. Automatic timer controls (2) germicidal lamps. Locks included. Goggles and glasses are not included. Needs electrical source.

F. **Synergy Sink** by Sheldon Laboratory Systems

Molded sink with 1" top work surface are epoxy resin.

The sink is a two tiered trapezoidal shape where the base of the trapezoid is curved to match the curve of the counter top. The deep rear section is to allow larger lab items access and cleaning. The width of the rear is 22.5" wide and the width of the front is 28.375". The ADA section of the sink is 4.75" deep and has integrated drain grooves.



The rear section is a minimum of 11.5" deep and the overall length front to back dimension is minimum of 22". Sink shall hold a minimum of 19 gallons. The deep section shall be large enough to set a dissection tray flat in the basin, and enough depth to accommodate a minimum of 15 inches of standing height for cleaning beakers.

Sink can be mounted at ADA height and incorporate compliant casework and metal knee panel. Rough in services are contained behind the knee panel.

Sink can be mounted in 34" working height and incorporate appropriate casework and rough in are to contain services required.

Fixtures are mounted to have anti splash characteristic flowing on the sloped portion of the sink.

**Approved equal for Synergy Sink:** Durcon model #A26 ADA sink.

Sink must be bi-level and ADA accessible. Sinks must provide a sink bowl with a minimum of 18" x 15" x 5"/11" clearance that allows for the cleaning of dissection trays and other standard science apparatus. Sink bowl shall allow a minimum of 14" in height for glassware cleaning; clearance of 14" shall be from sink bottom to faucet bib. Sink bowl shall be designed to hold a minimum of 14 gallons of water.

#### G. Drying Rack

Drying racks are 1" phenolic resin with (32) white plastic pegs 5" long and 3/8" diameter with stainless steel drip trough.

#### H. Fume Hood

FUME HOODS: EDU-M-60 Mobile ductless fume hood

##### MATERIALS - GENERAL

- A. Exterior: Manufacturer's standard steel superstructure with epoxy finish and clear front, rear and side panels. Locking casters and pull handles allow for easy mobility
  - 1. Front safety panel shall be double hinged to allow access to hood interior providing a constant face velocity of 100 FPM airflow in the closed position. Hinges are self locking to prevent accidental closing when loading and unloading.
- B. Work surface: Manufacturer's standard polypropylene material.
- C. Glazing: Acrylic or polycarbonate panels.

##### HOOD CONSTRUCTION AND COMPONENTS

- A. General: Dynamic filter chamber designed to collect, retain and dispose of hazardous fumes with complete safety, minimum purging of air from room supply, and minimum turbulence within hood chamber. Provide fume hood with integrated centrifugal fan motor/blower assembly mounted beneath the work surface. A clear internal baffle creates a smooth and optimal airflow pattern. Compact fluorescent lighting is mounted above the work zone in a vapor-proof compartment.
- B. Hood dimensions: 60 inches wide by 28.5 inches deep by 79 inches high with

an internal height of 31.5 inches.

C. Filtration: Manufacturer's standard "Multiplex" filtration system consisting of a pre-filter and main filter

1. Electrostatic pre-filter: 99.5% effective electrostatic pre-filters (2) accessible from inside the filter chamber to contain the release of any particulates.
2. Main filter: EDU multilayered carbon filters (2) for acid, amine, organic and solvent vapors
3. Filter door: must have ID window to display filter type and installation date. Door must be key-locked to prevent unauthorized access or accidental exposure.
4. Filter clamping system ensures a proper seal and allows filters to be replaced without disassembly or special tools. A track-and-wheel system allows used filters to slide out and into a bag for safe disposal.

D. Fan control: Variable

E. Cup sink, cold water faucet and gas petcock installed on the worktop. Control valves are mounted outside of the hood and are color coded.

F. A duplex outlet (5A) will be located on the outside of the hood.

G. Cable pass-through ports: located on rear wall, provided with removable caps.

H. Fluorescent lighting: must be integrated into the fan/filter section in a sealed, vapor-proof chamber to prevent exposure or interaction with chemical vapors.

I. Unit will operate on 110v, 60hz power. A 6ft NEMA 5-15P cord is provided.

J. Reports: All units are supplied with individual test reports, certificate of compliance, and a user manual that includes operating and troubleshooting procedures, a maintenance log and chemical compatibility data.

K. Warranty: Legacy Limited Lifetime Warranty ([www.airscience.com/warranty](http://www.airscience.com/warranty))

#### QUALITY ASSURANCE:

Air Science's EDU-M-60 model is specified as the basis of design, quality and layout. Any other manufacturers wishing approval must meet all requirements of the specification and submit within (5) days of bid for prior approval. Approved manufacturers will be listed by addendum prior to bid. Only manufacturers meeting the standards in the specification will be acceptable.

### PART 3 – EXECUTION

#### 3.1 INSTALLERS

- A. Installer Qualifications: For installation and maintenance of units, an authorized representative of the casework manufacturer required for this project.

#### 3.2 EXAMINATION

- A. Site Verification of Conditions: Casework will not be delivered or installed until the following conditions have been met:
- B. Building must be enclosed (windows and doors sealed and weather-tight);
- C. An operational HVAC system that maintains temperature and humidity at occupancy levels must be in place; Relative humidity must be regulated and stable between 25%

and 55% per AWI standards before products are brought on site, throughout project completion and with the site moving forward while the building is in use by the owner.

- D. Ceiling, overhead ductwork and lighting must be installed;
- E. Site must be free of any further construction such as "wet work."
- F. Required backing and reinforcements must be installed accurately and the project must be read for casework installation.

### 3.3 INSTALLATION

#### A. Casework Installation:

- a. Casework should be set with components plumb, straight and square, securely anchored to building structure with not distortion. Concealed shims should be used as required.
- b. Cabinets in continuous runs should be bolted together with joints flush, uniform and tight with and alignment of adjacent units not to exceed 1/16 of an inch.
- c. Wall casework should be secured to solid material, not lath, plastic or gypsum board.
- d. Top edge surfaces should be abutted in one true place. Joints are to be flush and should not exceed 1/8 of an inch between tops units.
- e. Casework and hardware shall be adjusted and aligned to allow for accurate connection of contact points and efficient operation of doors and drawers without any warping or binding.

#### B. Countertop Installation:

- a. Countertops are to have been fabricated in lengths according to drawings, with ends abutting tightly and sealed with corrosion resistant sealant.
- b. Tops will be anchored to base casework in a single true plane with ends abutting at hairline joints with no raised edges at joints.
- c. Joints shall be factory prepared having no need for in-field processing of top and edge surfaces.
- d. Joints should be dressed smoothly, surface scratches removed and entire surface cleaned thoroughly.

#### C. Cleaning

- a. Ensure all products are unsoiled and match factory finish. Remove or repair damaged or defective units.
- b. Clean all finished surfaces, including drawers and cabinet shelves, and touch up as necessary.
- c. Countertops should be cleaned and free of grease or streaks.

#### D. Protection:

- a. Counter tops and ledges should be protected with 1/4 inch ribbed cardboard or plastic covering of 6mm thickness.

END OF SECTION 12345

## SECTION 12500 - WINDOW TREATMENT

### PART 1 - GENERAL

#### RELATED DOCUMENTS:

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

#### DESCRIPTION OF WORK:

The extent of window treatment is indicated on drawings and in schedules. Types of window treatment work in this section include:

1. Horizontal blinds

Location: At all exterior windows.

#### QUALITY ASSURANCE:

General: Provide window treatment units which are complete assemblies produced by one manufacturer for each type required, including hardware, accessory items, mounting brackets, and fastenings.

Furnish materials in colors and patterns as indicated, or, if not indicated, as selected by Architect from manufacturer's standard colors/patterns.

#### SUBMITTALS:

Product Data: Submit manufacturer's specifications and installation instructions for each type of window treatment unit required. Include methods of installation for each type of opening and supporting structure.

Shop Drawings: Submit shop drawings for special components and application conditions of window treatment units which are not fully dimensioned or detailed in manufacturer's product data. Show relationship to adjoining work.

1. Include typical elevation layout indicating proposed division between blind units and meeting edges at corners. Provide sections and details at head and sill between blind units and corners including inclined installations.
2. Provide schedule of all units to be furnished, including field measurements at each location.

### Samples:

For selection of colors, submit manufacturer's color charts consisting of sections of exposed components with integral or applied finishes showing full range of colors, materials, etc. available for each type of window treatment assembly required.

## PART 2 – PRODUCTS

### HORIZONTAL BLINDS:

Manufacturers: The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:

Bali (Carey-McFall Corp.); Montgomery, PA 17752  
Levolor; Fort Lee, N. J. 07024  
Graber Industries, Inc.; Middleton, WI 53562

Equal products of other manufacturers may be used in the work, provided such products have been approved by the Architect not less than five (5) days prior to scheduled bid opening.

Headrail: Manufacturer's standard headrail consisting of channel-shaped section complete with tilting mechanism, top and end braces, top cradles, cord lock, and accessory items required for type of blind and installation indicated.

Bottom Rail: Manufacturer's standard tubular steel bottom rail, designed to withstand twisting or sagging. Contour top surface to match slat curvature, with flat or slightly curved bottom. Close ends with manufacturer's standard metal or plastic end caps, of same color as rail. Finish rail in same color as slats, unless otherwise indicated.

Slats: Manufacturer's standard, spring-tempered aluminum slats, nominal 0.008" thick, (louver blades), rounded corners with forming burrs removed, as follows:

1. Slat Width: 1" nominal slats, with other components sized to suit.
2. Provide slats designed and spaced to achieve maximum over- lap and closure for optimum light exclusion. Notch rear of blade at ladders and offset rout holes at lift cords to enable blades to touch one another when closed.

Ladders: Manufacturer's standard ladder construction designed to support and maintain slats at proper spacing and alignment in open and closed positions, as follows:

1. Braided polyester cord design consisting of vertical components of not less than 0.043" nor more than 0.068" in diameter and integrally braided ladder rungs of not less than 4 threads; space ladders not further than 23" apart and 7" from ends of slats.

Tilting Mechanism: Manufacturer's standard assembly including disengaging worm and gear mechanism to eliminate overdrive, low friction gear tilter, drum and cradle at each ladder, tilt rod, tape clips, and grommet guides to prevent wear on ladder and cords; designed to hold slats at any angle and prevent movement of slats due to vibration, operated as follows:

1. Wand Operation: Manufacturer's standard, detachable clear plastic wand, of proper length to suit blind installation, to provide convenient operation, and detachable without tools by raising locking sleeve.

Lifting Mechanism: Manufacturer's standard including crash-proof cord locks with cord separators and braided polyester or nylon lift cords with tassels at ends. Size cord to suit blind type. Include cord equalizers of self-aligning type designed to maintain horizontal blind position.

Installation Brackets: Manufacturer's standard brackets designed to facilitate removal of head channels. Provide intermediate brackets at spacing recommended by blind manufacturer. Include hardware necessary for secure attachment of brackets to adjoining construction and to head rails. Design brackets to support safely the weight of blind assemblies plus forces applied to operate blinds.

Finish: Provide finishes indicated below. Finish exposed accessories and hardware to match rail color. Provide manufacturer's standard corrosion resistant finish to concealed items of hardware.

1. Aluminum Slats: Provide manufacturer's standard factory- applied finish system consisting of chemical conversion coating followed by baked-on synthetic resin enamel finish coat.

#### FABRICATION AND OPERATION:

Prior to fabrication, verify actual opening dimensions by accurate site measurements. Adjust dimensions for proper fit at openings. Cooperate with other trades for securing tracks to substrates and other finished surfaces.

Fabricate window treatment components from non-corrosive, non- staining, non-fading materials which are completely compatible with each other, and which do not require lubrication during normal expected life.

Fabricate blind units to completely fill the openings as shown, from head-to-sill and jamb-to-jamb.

For continuous window wall installations, fabricate blinds so that ends occur only over mullions or other defined vertical separation, unless otherwise indicated.

Space supporting ladders to comply with manufacturer's standards, unless otherwise indicated.

Space louver blades to provide a minimum overlap of 3/8" for light exclusion when in fully-closed position. Gear operating equipment for reduction of the ratio of hand-movement to louver position, so that blinds operate easily and can be set accurately and smoothly.

Equip horizontal blind units, unless otherwise indicated for the following operation.

1. Full-tilting operation with slats rotating approximately  $180^{\circ}$ . Place tilt operating controls on left-hand side of blind units, unless otherwise indicated.
2. Full-height raising to manufacturer's minimum stacking dimension, with lifting cord locks for stopping blind at any point of ascending or descending travel. Place pull cords on right-hand side of blind units, unless otherwise indicated.

### PART 3 – EXECUTION

#### INSTALLATION:

**General:** Install window treatment units in manner indicated to comply with manufacturer's instructions. Position units level, plumb, secure, at proper height and location relative to adjoining window units and other related work. Securely anchor units with proper clips, brackets, anchorages, suited to type of mounting indicated.

Provide adequate clearance between sash and blinds to permit unencumbered operation of sash hardware.

Isolate metal parts from concrete and mortar to prevent galvanic action. Use tape or thick coating or other means recommended by manufacturer to effect separation.

Protect installed units to ensure their being in operating condition, without damage, blemishes, or indication of use at completion of project. Repair or replace damaged units as directed by Architect.

END OF SECTION 12500

## SECTION 13670 - EXTRUDED ALUMINUM WALKWAY COVER (FLAT CANOPY)

### PART 1 - GENERAL:

#### RELATED DOCUMENTS:

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

Scope of Work: The work covered by this section shall include furnishings and installing Aluminum Canopy, decking, fascia. The canopy shall consist of structural aluminum panels bound by a framework of fascia which also acts as a water collecting gutter. All components shall be as required to support design loads in accordance with engineering prints and calculations provided by the manufacturer, sizes shown on the drawings are for diagrammatical purposes only.

#### RELATED DOCUMENTS:

The bidding requirements, general conditions, supplementary conditions, drawings and requirements of division one specification shall apply to work specified in this section.

#### DESCRIPTION OF WORK:

The extent of aluminum walkway cover is shown on the drawings and as specified herein.

Definition: Type 1, Extruded Aluminum Walkway Cover shall consist entirely of extruded aluminum sections (roll-formed not acceptable). System shall consist of decking, fascia, accessory items and hardware to provide a complete system.

Water shall drain from deck into the existing beams and out at grade level of columns through weepholes.

#### SUBMITTALS

Shop Drawings: Submit detailed drawings, layout of walkway cover system, all mechanical joint locations with complete details, connections, jointing and accessories.

Product Data: Submit manufacturer's product data, specifications, component performance data and installation instructions.



## QUALITY ASSURANCE

Codes and Standards: Comply with provisions of the following except as otherwise indicated.

1. International Building Code, latest addition with amendments, if any.  
AWS (American Welding Society) standards for structural aluminum welding.

Manufacturer: Obtain aluminum covered walkway system from only one (1) manufacturer, although several may be indicated as offering products complying with requirements.

Installer Qualification: Firm with not less than three (3) years experience in installation of aluminum walkway covers of type, quantity and installation methods similar to work of this section.

Field Measurements: Take field measurements prior to preparation of shop drawings and fabrication where possible, to insure proper fitting of work. However, allow for adjustments within specified tolerations wherever taking of field measurements before fabrication might delay work.

Shop Assembly: Pre-assemble units in shop to greatest extent possible and disassemble as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.

Coordination: Coordinate work of this section with work of other sections which interface with covered walkway system (sidewalks, curbs, building fascias, etc.).

## PERFORMANCE REQUIREMENTS:

System Performance: Provide aluminum covered walkway system that has been designed, produced, fabricated and installed to withstand normal temperature changes as well as live loading, dead loading and wind loading in compliance with Standard Building Code requirements for geographic area in which work is located and as follows:

1. The system shall be designed by a registered Engineer in the State of Alabama, certifying the system meets all wind, foundation and all other applicable loads and requirements set forth by local or state building requirements.  
Live Load: 30 p.s.f. minimum  
Structural design for wind forces: Comply with ANSI A58.1-1982  
Design Wind Velocity: **120.p.h.**  
Importance Factor: 1.1.  
Stability Criteria: International Building Code 2015

Sizes shown on drawings are to be considered minimum.

Roof structure shall be capable of sustaining severe icing, hail, hurricane force winds and supporting a concentrated load such as being walked upon.

## PART 2 – PRODUCT

MANUFACTURERS: The following manufacturers products have been used to establish minimum requirements for materials, workmanship, and function:

Tennessee Valley Metals Extruded Aluminum Walkway Cover System is specified as the standard of quality.

Equal products of other manufacturers may be used in the work, provided such products have been approved, by the Architect, not less than five (5) days prior to scheduled bid opening.

Approved Equals:

Tennessee Valley Metals, Inc.  
2720 Southeastern Circle  
Birmingham, AL. 35215

Dittmer Architectural Aluminum  
1006 Shepherd Road  
Winter Springs, Florida 32708

Royal Aluminum  
US Highway 441  
Leesburg, Florida 34789-5008

Superior Aluminum Products  
116 Clayton Court  
Birmingham, Alabama 36209-6307

## MATERIALS

All aluminum extrusions shall be alloy 6063 heat treated to a T-6 temper.

Standard finish for all components shall be satin anodize 204-R1 meeting Aluminum Association Specification AA-M-10C-22A-21.

Color to be selected from manufactures standards.

### Fasteners:

Deck Screws (rivets not permitted): Type 18-8 non-magnetic stainless steel sealed with a neoprene "O" ring beneath 5/8" outside dimension, conical washer.

Fascia Rivets: Size 3/16" by 1/2" grip range aluminum rivets with aluminum mandrel.

Bolts: All bolts, nuts and washers to be 18-8 non-magnetic stainless steel.

Tek Screws: not permitted

### WARRANTY

Manufacturer shall warrant the entire system against defects in labor and materials for a period of one (1) year commencing on the date of substantial completion as established in Division One of these specifications.

Intention of this warranty is the manufacturer will come onto the jobsite and do all necessary to effect corrections of any deficiencies.

Prima Facie Evidence of defects in labor and material may include but is not limited to, one or more of the following:

1. Moisture leaks
2. Metal failure including excessive deflection
3. Fastener failure
4. Finish failure

### FABRICATION

Comply with indicated profiles, dimensioned requirements and structural requirements.

Use sections true to details with clean, straight, sharply defined profiles and smooth surfaces of uniform color and texture, free from defects impairing strength and durability.

All welding to be done by heli-arc process.

Bents shall consist of shop welded one piece units. When size of bents do not permit shipment as a welded unit, concealed mechanical joints may be used.

Mechanical joints shall consist of stainless steel bolts with a minimum of two (2) bolts per fastening. Bolts and nuts shall be installed in a concealed manner utilizing 1/2" thick by 1 1/2" aluminum bolt bars welded to structural members. All such mechanical joints must be detailed on shop drawings showing all locations.

Roof Deck: Flush deck extruded aluminum shapes, interlocking self-flashing sections. Shop fabricate to lengths and panels widths required for field assembly. Depth of sections to comply with structural requirements. Provide shop induced camber in deck units with spans greater than 16'- 0" to offset dead load deflections. Welded dams are to be used at non-draining ends of deck.

Expansion joints, design structure for thermal expansion and contraction. Provide expansion joints as required.

Exposed rivets used to fasten bottom of fascia to deck to have finish to match fascia.

Apply a shop applied dip-coat of clear acrylic enamel to each column end terminating in concrete to insulate from electrolytic reaction. Column ends shall be pierced to "key" grout to bent for maximum uplift protection.

### PART 3 – EXECUTION

#### DELIVERY, STORAGE AND HANDLING:

Deliver, store and handle covered walkway system components as recommended by manufacturer. Handle and store in a manner to avoid deforming members and to avoid excessive stresses.

#### EXAMINATION

Examine adjacent work for conditions that would prevent quality installation of system.

Do not proceed until defects are corrected.

#### FIELD DIMENSIONS

General contractor shall field confirm all existing locations, dimensions and elevations shown on shop drawings prior to fabrication.

#### INSTALLATION

Install roof deck sections, accessories and related flashing in accordance with manufacturer's instructions. Provide roof slope for rain drainage without ponding water. Align and anchor roof deck units to structural support frames.

Assemble all components in a neat, workmanlike manner.

## FLASHING

Flashings: Flashings required between covered walkway system and adjoining structures are not work of this section. Refer to "Flashing and Sheet Metals", Section 07600.

## CLEANING AND PROTECTION

Damaged Units: Replace roof deck panels and other components of the work which have been damaged or have deteriorated beyond successful minor repair.

Cleaning: Remove protective coverings at time in project construction sequence which will afford greatest protection of work. Clean finished surfaces as recommended by manufacturer. Maintain in a clean condition during construction.

END OF SECTION 13670

These specifications sections were prepared by and under the direct supervision of the Engineer of Record for this project.

Division 15 – MECHANICAL

15010	Mechanical General Provisions
15400	Plumbing
15700	Heating, Ventilating & Air Conditioning



September 7, 2018

## SECTION 15010

### GENERAL MECHANICAL PROVISIONS

#### PART 1. GENERAL

- 1.1. **General Requirements:** Division One is applicable in full hereto. For the purpose of this specification the word, "provide", shall mean, "furnish and install, complete and ready for use". **No materials or products that contain asbestos, formaldehyde, lead or mercury, in excess of limits mandated and defined by OSHA, LEED and the EPA, shall be utilized.**

Manufacturers not named in the specifications require prior approval, seven (7) days prior to bid date. Follow procedures set forth in Division 1 of the specifications.

- 1.2. **Spare Parts:** Manufacturer of any equipment specified shall have a wholesale outlet for readily available replacement parts in the nearest major USA city.
- 1.3. **Codes and Standards and Listings:** Unless specified otherwise, comply with all current editions of all referenced publications within these specifications and all current editions of applicable NFPA, ASME, OSHA, IBC, ASHRAE, ASTM, ASME, ANSI, SMACNA, Americans with Disabilities Act (ADA), 2010 ADA Standards for Accessible Design, with Local Building Codes, Mechanical Codes, Gas Codes, Plumbing Codes, ANSI/ASHRAE/IESNA Standard 90.1 (2013), International Energy Conservation Code, International Fuel Gas Code, International Fire Code, Americans with Disability Act Accessibility Guidelines and with all applicable local ordinances and codes. Equipment shall bear Underwriters Laboratories Inc. (UL) listing label, Canadian Standards Association (CSA) listing label or ETL approved rating. All electrical components and products shall also comply with the respective Code of Federal Regulations (CFR).

Where conflicts occur between a Code, Standard or Listing and the contract drawings or contract specifications, the most stringent requirements shall govern and be applied. Advisory provisions listed in all Codes referenced in the Contract Documents are mandatory and the word "should" shall be interpreted as "shall".

- 1.4. **Permits:** Provide all permits, pay all fees and arrange for inspections as required by all applicable Governing Authorities. Furnish certificates of all inspections and approvals from all Governing Authorities. Provide additional materials, parts, methods, etc. and modify the work as required by Governing Authorities' Inspections and Regulations. Correct all deficiencies required by Code officials at no additional cost to the Owner or the Owner's Project Design Professionals.
- 1.5. **Inspections:** It is the contractor's responsibility to have the job ready for inspections when they are scheduled. If the project is not ready for the requested inspection and the Architect, any governmental agency or any other entity requires a re-inspection, the contractor shall pay Zgouvas, Eiring & Associates a re-inspection fee of \$1,500. The payment shall be made directly to Zgouvas, Eiring & Associates 5 days prior to the scheduled re-inspection.

The Contractor shall also refer to Paragraph "Identification" in this Section of the specifications and note that **identification shall be completed before certain inspections. Failure to comply with the identification section of the specification**

**will be cause for cancellation of the inspection, and thus, requiring a reinspection fee.**

- 1.6. Drawings:** In the interest of clearness, the work is not always shown to scale or exact location. Check all measurements, location of pipe, all required appurtenances for duct and piping, ducts, and equipment with the architectural and electrical drawings, and lay out work so as to fit in with ceiling grids, lighting and other parts. Make minor adjustments in the field as required to provide the optimum result to facilitate ease of service, efficient operation and best appearance. Where doubt arises as to the meaning of the plans and specifications, obtain the Architect's decision, in writing, before proceeding with parts affected; otherwise assume liability for damage to other work and for making necessary corrections to work in question. **DO NOT SCALE** the Plumbing, Fire Protection or HVAC drawings. The various scales used on the drawings do not allow for all fittings, offsets and accessories that may be required to complete the work. The Contractor shall carefully investigate the conditions that would affect the work to be performed and shall arrange such work as necessary to comply with the intent of the construction documents. Refer to Architectural drawings for dimensions and verify scale shown on the drawings. All drawings are diagrammatic and are intended to quantify the materials specified and indicate their intended relationship to each other. The drawings and specifications are complementary and work shown, but not specified, or specified, but not shown, shall be the same as though required by both.

The Contractor shall carefully examine the contract documents during the bidding phase. Any missing information in the contract documents that is required for obtaining accurate pricing shall be brought to the attention of the Architect, **prior to bid date**, so all may be clarified and/or corrected. Failure to identify and resolve the issues prior to bid shall require the Contractor to provide said items, complete, without additional cost to the Owner or the Owner's Project Design Professionals, using materials and methods specified by, and as directed by, the Owner's Design Professionals.

- 1.7. Conflicts, Coordinations and Changes:** In the event that interferences or conflicts occur, the Architect shall decide which equipment shall be relocated regardless of which was first installed. In the interest of avoiding such conflicts, each Sub-Contractor who is using common space, etc., shall coordinate his work with all other trades and other parts of his own work. If, during this coordination, it is discovered that necessary or desirable changes should be made, advise the Architect and secure his decision in writing. Do not fabricate any duct nor install any pipe until all coordination has been accomplished.

- 1.8. Coordination Drawings:** Follow procedures set forth in Division One. Before starting work, submit for approval, coordination shop drawings showing proposed arrangement of equipment, all piping, ducts, floor drains, power requirements, and controls. As a minimum, submit detail layouts of potential conflicts at plumbing risers, equipment rooms, limited ceiling space, etc. Refer to subsequent Sections for additional specific requirements.

Failure to submit shop drawings will make the Contractor responsible for changes required to facilitate installation of, and the proper operation of, all systems at no additional cost to the Owner or the Owner's Project Design Professionals.

- 1.9. Maintenance, Replacement and Service Access:** Locate equipment as shown on the plans. The Contractor shall install equipment, valves, piping, etc. with the maintenance, service and replacement access required by the Manufacturer of the respective



installed item. All items shall be installed to provide maximum safety, service, replacement and maintenance access. All piping with valves, mechanical equipment and other items that may require maintenance, service or replacement, shall be located no more than 24" above the finished ceiling and no more than 14'-0" above finish floor in areas without ceilings, to ensure proper access.

Coordinate all questionable access or location of items that may present a problem, if installed as specified above, with the Engineer or the Architect's field representative prior to installing any item; else, relocation will be at the Contractor's expense once discovered.

- 1.10. **Warranty:** Refer to Division 1. Additionally, guarantee in writing to make good without cost any defects in materials and workmanship for one year following the date of substantial completion of the project as determined by the Architect, to include a minimum of five (5) years for all air conditioning equipment compressors. Provide free maintenance and service during the guarantee period. See other Division 15 Sections for additional requirements for guarantee of air conditioning compressors, air filter replacement, sensor operated plumbing fixtures, etc.
- 1.11. **Submittal Data:** Partial or incomplete submittals will not be reviewed. Within 25 days after award of the contract, submit for approval a complete schedule of material and equipment proposed. When incomplete schedules of materials and equipment are submitted, the Contractor is responsible for providing all items as specified. Include catalog data, scheduled capacities, fan curves, sound data, etc.

Manufacturers not named in the specifications require prior approval. Follow procedures set forth in Division 1 of the specifications. Where substitutions are proposed, unless the Contractor states in writing, on a separate summary sheet in the front of the respective submittal, the differences of the substituted equipment or material, he shall be held responsible to replace such items any time discrepancies are found.

All submittals shall be separately bound in pdf format. Submittals shall be electronically indexed and tabbed. Refer to the Architectural General Conditions and Division 1 for the format required by the Architect.

A cover sheet shall be provided in the front of the submittal package which states, as a minimum, the Project name and location, the name of the Owner, the Architectural firm, the Engineering firm, the General Contractor, the Mechanical Contractor and each Contractors' point of contact, with phone number. A summary sheet shall be inserted at the beginning of each tabbed section to summarize the contents of each respective tabbed section. **The summary sheet shall include any items that have been changed or removed due to Project cost constraints, addendums or Value Engineering (VE).** Include materials used, methods of installation, product manufacturer, equipment capacities, etc. HVAC equipment items shall follow the identical tabular format, category by category, shown on the HVAC equipment schedules. As a minimum, the summary sheet shall indicate the **submitted values compared to each of the specified values. Failure to provide the submittals in the format specified will be cause for automatic rejection without review.** Plumbing and Fire Protection submittals shall follow the identical procedure specified for the Mechanical Contractor

**The General Contractor shall review and approve all submittals prior to submitting them to the Architect.** Submittals without the General Contractor's approval

will be rejected without review.

- 1.12. **Submittal Rejection and Resubmittal:** The Contractor shall carefully review submittal data requirements above and pay particular attention to specific items within the specifications that are cause for immediate rejection when submittals are not provided to the Engineer as specified. Any submittal or portions thereof that are rejected TWICE and resubmitted a third time for review will require the Contractor to reimburse the Engineer for his time. **The minimum fee for reviewing any item or submittal a third time is \$500.**
- 1.13. **Site and Existing Conditions:** Bidders shall visit the site and become acquainted with all job conditions. Report to the Architect, prior to bid, any conditions that are required to accomplish the installation of all systems. Provide for required adjustments to complete the intent of the work. No consideration will be given after bid opening for alleged misunderstanding regarding job conditions, utility connections, permits, fees, etc.
- 1.14. **Line Locators:** Before proceeding with excavating or trenching, arrange with the Owner, all utility companies, and line locating firm(s) to describe and mark all of the systems which might be damaged by construction operations.
- 1.15. **Phasing:** Interrupt existing services only at times approved by the Architect and the Owner. The General Contractor shall provide a written request to the Architect and the Owner for permission to interrupt services to the facility. The request shall be provided a minimum of seven (7) days prior to the desired date of the interruption. Hold interruptions to a minimum in duration and frequency.
- 1.16. **Record Documents:** Provide in such detail, as is set forth under General and Supplemental Conditions.

Additionally, keep an accurate record of changes made during construction. The Contractor shall complete the Record Documents, using the As-Built Drawings from the General Contractor's construction site office. Transfer these changes to a set of reproducible copies of original drawings that the Architect will sell to Contractor at printing cost. The drawings will be provided to the Contractor "As Is". The final drawing set within the Record Documents shall be labeled "Record Documents" in the Title Block and shall not include "clouds" or other indications of the changes during the project process. The Contractor shall provide hard copies and an electronic set of all documented modifications to the contract documents.

The Contractor is responsible for providing and showing all changes to the drawings that are different from the original contract drawings, including but not limited to addendums, change-orders, VE items, RFI's, test reports, field observation/inspection reports, etc. Hard copy plans may be a set of reproducible copies of the final corrected contract drawings. When work is completed, submit corrected reproducible drawings to the Architect for record and include copies in the Owner's Operating and Maintenance Manual. Record documents shall also be provided in PDF digital format on CD-R type CD(s).

## **PART 2. WORK RELATED TO OTHER TRADES**

- 2.1. **Foundations and Supports:** Respective Plumbing, Mechanical or Fire Protection Contractor shall provide foundations, supports, etc. not specified under other Divisions and as required to mount all items in a safe, sound, professional and structurally sound

manner. The respective Contractor shall provide all supplemental steel between various types of structural members, including between bar joists, purlins, miscellaneous structural items, etc. as required for the item(s) proper support. Where the Contractor has doubt as to proper supporting requirements, he shall consult with, and seek the guidance of, the Architect and the project Structural Engineer. Consult all contract documents pertaining to other trades to determine extent of their work. Concrete pads for outside equipment are specified under other Sections. Concrete work shall meet requirements of Division 3.

- 2.2. Pipe Sleeves:** Fit all pipes passing through walls, partitions and floors (except slabs on grade construction) with sleeves. Sleeves shall be built-in as work progresses. Sleeves in existing construction shall be firmly grouted in place. Sleeves for pipe passing through interior walls or partitions shall be 20 gage galvanized steel, 1/2" larger in diameter than pipe or piping covering and **shall extend a minimum of 1" on each side of the partition and firestopped.** All floor sleeves shall be cast-in-place schedule 40 steel pipe. Floor sleeves shall terminate 2" above finish floor or housekeeping pad, as applicable, and 2" below the bottom side of the concrete foundation as applicable. Sleeves for pipe passing through exterior walls or partitions that contain refrigerant piping shall be Schedule 40 PVC pipe, 1/2" larger in diameter than piping and piping covering.

- 2.3. Access Panels and Doors:** Do not locate serviceable items above inaccessible, hard ceilings without written approval from the Architect. Coordinate all items locations with the Architectural ceiling plans before installing any items. Furnish access panels and doors to the General Contractor for installation wherever required for access to valves, controllers, actuators, dampers, air vents, cleanouts, smoke detectors and similar devices. Provide access door/panels in all plenums behind outside air intake louvers to facilitate cleaning of bird screens. Doors/panels shall be suitable for wall or ceiling finish involved, 16" x 16" unless otherwise indicated or as required to permit removal of equipment and/or provide acceptable maintenance access. Access panels and doors shall be fire rated where rated assemblies are penetrated. Access panels and doors for items located outdoors shall be weatherproof. Identify all access panels and doors to indicate item for which access is provided. Ex. Motorized damper, fire damper, filters, etc. Additionally, add the following to each access panel identifier: "*ACCESS PANEL - DO NOT BLOCK*". See specification section "Miscellaneous Requirements, Identification" for materials and methods required. Access panels and doors shall be as manufactured by Milcor, Philip Carey, Zurn or other approved equal. The Architect must approve the use of, and type of, panels and doors to be installed in areas which are exposed to view and in finished areas. Exposed access panels and doors shall be factory cleaned and primed for painting in the field. Colors shall be as selected by the Architect. Refer to Architectural Section, Painting, for additional information.

Where device occurs above a lift-out acoustical ceiling panel, provide engraved plastic labels of type specified in "Miscellaneous Requirements, Identification" below. In addition to identification of items above the ceiling, provide engraved plastic labels below the item, on the ceiling grid. Engraved plastic labels shall match ceiling grid color and be neatly glued to the ceiling grid adjacent to the ceiling tile that should be removed for access to the item. The label shall have engraved on it the item being identified and its designation as shown on the plans, valve chart, etc. Refer to Section "Identification" below for additional requirements.

- 2.4. Cutting and Patching:** Openings are to be laid out and built-in. Furnish detailed layout drawings to other trades in advance of their work. Failure to furnish layout shop drawings to General Contractor shall make the applicable

Mechanical/Plumbing/Fire Protection Contractor responsible to rebuild openings as directed by the Architect. Piping within walls or behind walls must be installed before wall is erected. Otherwise, walls, etc. affected must be reworked by trade which erected it at expense of the respective Contractor. Chasing and cutting of new work will not be accepted.

- 2.5. **Painting and Finishing:** Clean and paint with two coats of black latex paint all exposed ferrous metal parts of hangers, unistrut and other assemblies used for supporting of ducts (except duct straps/band hangers), piping and plumbing related items in mechanical rooms, crawl space, above ceilings, etc. Include black steel pipe, uncoated cast iron pipe, hangers, brackets, etc. **Bare, unprotected/uncoated steel or galvanized hangers, brackets, unistrut, supports, etc., are not allowed.** In lieu of painting, the Contractor may substitute factory painted, powder coated or epoxy coated items to prevent rusting of the items listed above. All paints and coatings shall have a fire hazard rating not to exceed 25 for flame spread and 50 for fuel contributed and smoke developed as determined by ASTM E84. Also, see specification section, "Identification" for additional requirements.

Painting of ducts, piping, grilles, diffusers and other surfaces in finished areas is specified in Architectural Section "Painting" or similar section. Refer to those sections for requirements. Where the Architectural specifications require items to be painted, the Contractor shall furnish it with a Manufacturer provided, factory applied prime coat.

Where factory finished items are marred, scratched or damaged, replace the item, or upon approval from the Architect or Owner, refinish or touch-up as required to bring to a like new condition.

### **PART 3. EXCAVATION, TRENCHING & BACKFILLING**

- 3.1. **Broken Pavement:** In public streets or on the project site, backfill and repair to satisfaction of authorities having jurisdiction and the Architect.

### **PART 4. PIPE HANGERS AND SUPPORTS**

- 4.1. **General:** Provide factory fabricated pipe hangers and supports for all piping of type and size specified bolts, washers, etc. as required for a complete functional installation. Material items, methods and general requirements not covered in this specification shall be provided in strict accordance with current edition of Manufacturer's Standardization Society Specification MSS SP-58 and Manufacturer's Published Product Information.
- 4.2. **Painting:** **Bare, unprotected/uncoated steel or galvanized hangers, brackets, supports, etc., are not allowed.** Clean and paint with two coats of black latex paint all exposed ferrous metal parts of hangers, unistrut and other assemblies used for supporting of any piping and plumbing related items in mechanical rooms, crawl space, above ceilings, etc. Include black steel pipe, uncoated cast iron pipe, hangers, brackets, etc. In lieu of painting, the Contractor may substitute factory painted, powder coated or epoxy coated items to prevent rusting of the items listed above. All paints and coatings shall have a fire hazard rating not to exceed 25 for flame spread and 50 for fuel contributed and smoke developed as determined by ASTM E84. Also, see specification section, "Identification" for additional requirements..

- 4.3. **Spacing:** Install supports as required to prevent sags, bends or vibration. Provide additional building supports and attachments where support is required for additional concentrated loads, including valves, in-line pumps, flange guides, strainers, expansion joints and at all changes in direction of piping.

At no-hub pipe, support as specified below for cast iron piping.

**In all cases**, provide on all sides of, and within 6 inches of, all elbows, take-off fittings, joints, valves, any change in direction of item supported, at ends of branches over 5 feet long and on centers not exceeding the following:

<u>Piping Material</u>	<u>Pipe Size</u>	<u>Maximum Spacing</u>
Copper tubing	1 1/4" or less	6 ft. Horizontal 8 ft. Vertical
	1 1/2" or larger	8 ft. Horizontal 8 ft. Vertical
Steel pipe	All	6 ft. Horizontal 8 ft. Vertical
Cast Iron	All	4 ft. Horizontal 10 ft. Vertical

Where cast iron pipe is installed in 10ft. lengths, spacing may be increased to 8ft. In addition to specified cast iron support requirements, provide additional support for cast iron pipe within 6" of each fitting on all sides of the fitting.

Schedule 40 PVC	All	4 ft Horizontal 8 ft. Vertical
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For Schedule 40 pipe sizes 2" and smaller, a guide shall be installed midway between the required vertical supports. Such guides shall prevent pipe movement in a direction perpendicular to the axis of the pipe.

- 4.4. **At Typical Suspended Horizontal Pipe:** Painted, powder coated or epoxy coated adjustable clevis or split-ring type equal to Elcen Fig. 12 or 10c. See part "Hanger Rods" below for limitations on use of clevis hangers. Do not use clevis hangers for refrigerant piping. See refrigerant piping support requirements in Section 15700, Refrigerant Piping and Accessories. Painted, powder coated or epoxy coated items shall have a fire hazard rating not to exceed 25 for flame spread and 50 for fuel contributed and smoke developed as determined by ASTM E84.
- 4.5. **Sway Bracing:** For all drainage piping greater than 4 inches, restraints shall be provided for drain pipes at all changes in direction and at all changes in diameter greater than two pipe sizes. Braces, blocks, rodding and other suitable methods as required by the coupling manufacturer shall be utilized. Sway bracing shall be Eaton/Cooper B-Line Tolco Steel Pipe Clamps for Sway Bracing, transitional fittings, bracing, etc. as required for a complete sway braced assembly. The entire bracing assembly shall be selected and sized by the Manufacturer. All components of the finished assembly shall be of a single manufacturer, resulting in a UL listed and FM approved sway bracing assembly. Eaton/Cooper B-Line is basis of design. Equivalents by Anvil International, Rilco Manufacturing Co and Piping Technology and

Products will be considered.

- 4.6. **Manifolds and Parallel Runs:** At his option, Contractor may provide a painted, powder coated or epoxy coated Unistrut system complete with standard fittings, clamps and accessories required. Refer to "Hanger Rods" below for locations that require a unistrut assembly. Furnish for approval proposed system components. Regardless of system used, **piping insulation shall be continuous and not cut away for installation of clamps, etc.**

Unistrut assemblies shall also be provided for refrigerant piping. Refer to Section 15700, Refrigerant Piping and Accessories for additional requirements.

- 4.7. **Where in Contact with Copper Pipe:** Same as above except assembly shall be copper plated.
- 4.8. **Hanger Rods:** Shall be mild steel, threaded as required. Use not smaller than 3/8" rods for pipe 2" and under, 1/2" rods for pipes 2 1/2" through 4", 3/4" rods for 5" through 12" and 1" rods for piping over 12", but generally as standard for the hanger selected. Support rods with threaded Underwriters' listed inserts, expansion shields or beam clamps shall be all galvanized. Beam clamps shall be equal to Elcen Fig. 34 or 36 with rod and eye end.

At bar joists, support from bottom chord at panel points. For piping over 6" provide supplemental steel angle supports and welding to span 3 joists when running parallel to joists and welded angle between two panel points for piping running perpendicular to joists. Concrete inserts shall be equal to Grinnell Figure 282.

Wherever piping hanger support rods heights exceed 36" length from top of the supported item to the structure above, Contractor shall provide a uni-strut support assembly and bracing of the assembly with minimum 1"x1"x1/4" angle iron or as required for the weight of the supported item, whichever is greater, and anchor to structure above to prevent swaying. Assembly shall be welded at connection to unistrut and building structural assembly. Follow welding procedures set forth in the structural division of the specifications.

- 4.9. **Bracing:** Where hanger rods heights exceed 36", provide sway bracing as specified above in "Hanger Rods". Bracing shall be provided at each uni-strut assembly and attached to the building structural system.
- 4.10. **Approved Equivalents:** By Grinnell, Elcen, Stockham or Crane will be accepted.

## **PART 5. MISCELLANEOUS REQUIREMENTS**

- 5.1. **Materials and Equipment:** New and of best quality in every respect. Pipe and fittings shall conform to the ASTM Standard designated for pipe of each material. Equipment shall bear Underwriters Laboratories Inc. (UL) listing label, Canadian Standards Association (CSA) listing label or ETL approved rating. All electrical components and products shall also comply with the respective Code of Federal Regulations (CFR). All pressure vessels shall be constructed and tested in accordance with applicable ASME Codes and shall bear ASME stamps unless specified otherwise. Minimum pressure rating shall satisfy job conditions. Where conflicts occur between a Code, Standard, Listing and the contract drawings or contract specifications, the most stringent requirements shall govern and be applied. Where two or more units of the

same class of equipment are required, these units shall be products of a single manufacturer, however, the component parts of each unit need not be. No materials or products that contain asbestos, formaldehyde, lead or mercury, in excess of limits mandated and defined by OSHA, LEED and the EPA, shall be utilized.

- 5.2. Workmanship:** First class, premium and in accordance with best practice. Pipe shall be cut clean, properly reamed, threaded or soldered, erected plumb and secure. Make changes in pipe size with reducing fittings without the use of bushings. Work shall be executed by experienced mechanics and shall present a neat appearance. Install all equipment in accordance with manufacturer's recommendations. Absolute coordination is required with the other Contractors on the project before proceeding with installation of any system or item.

At all stages of installation, protect pipe openings, fixtures, ductwork, condenser coils and equipment against the entrance of foreign materials and from damage by the elements, mortar, paint, etc... If air moving equipment must be used during construction, temporary filtration media with a Minimum Efficiency Reporting Value (MERV) of 8, as determined by ASHRAE 52.2-2012, and shall be installed at each return air grille, return air register, exhaust grille, exhaust register, and unit return air inlet. ALL open portions of ductwork and equipment shall be covered with a self-adhesive film (not visqueen) or airtight sheetmetal caps to prevent the intrusion of contaminants. All equipment openings, duct taps, duct take-offs, etc., shall be protected immediately after the tap, take-off, etc. has been fabricated in the field. In effect, there shall be no ductwork opening or equipment opening that is exposed to the ambient air. The material shall be a minimum of 3 mils thick and have a minimum tensile strength of 10 psi. It shall be waterproof and recyclable. Material shall be DuroDyne Dyn-O-Wrap or approved equivalent. Where bare sheetmetal is delivered unassembled to the job site, all ductwork shall be covered and protected with visqueen. After fabricating the duct in the field, the interior bare metal shall be wiped clean with a clean damp cloth before erection in the field. After erection, duct shall be protected as specified above. Any ductwork discovered to be unprotected as specified is subject to immediate rejection for use on this project.

- 5.3. Testing Documentation:** Through out the Division 15 specifications, there are various tests required. Provide the Architect written certification and results of all tests specified, including those indicating failure. The absence of written testing certification and results will be considered the same as if testing was never done. Include all testing documentation in the Operating and Maintenance Manuals.
- 5.4. Factory Finishes:** Furnish to the Architect, color cards for standard and premium colors available. **The Architect shall select color where choices exist.** Provide Manufacturer's standard color where color choices are not available. Coordinate all color selections with appropriate Architectural specification sections.
- 5.5. Expansion:** Provide for expansion and contraction of all piping, ductwork, etc. and make proper provisions so that excessive strain will not occur on piping, ductwork or other parts. Provide flexible connections for all piping and ductwork at all building expansion joints.
- 5.6. Safety Provisions:** Provide covers or guards on all hot, moving and projecting items that could be construed as a hazard to occupants of the building or to service personnel.
- 5.7. Cleaning and Adjusting:** Upon completion of work, clear all drains, traps, fixtures,

ducts and pipe. Adjust all valves, remove rubbish and leave work in clean and excellent operating condition. Install final permanent type filters only after cleaning of building is completed.

**5.8. Escutcheons:** Where pipes pass through floors, walls and ceilings of finished rooms provide pressed chrome-plated brass or steel plates securely fastened in place. Pack penetrations with insulation or firestopping compound as required. Caulk pipe openings behind escutcheons to prevent passage of smoke and make vermin proof.

**5.9. Identification:** All above ceiling identification specified, including firestopping identification, shall be completed prior to the above ceiling inspection. All remaining identification shall be completed prior to the final inspection. Failure to comply with this provision will be cause for cancellation of the inspection with all costs of the re-inspection to be borne by the Contractor responsible. All identification shall follow nomenclature used on the plans. Identify all piping, including refrigerant piping, and jacket of insulated pipe exposed to view and/or accessible through removable ceilings, attics or access panels, with Seton "Snap-Around" or Seton "Strap-Around" pipe line markers, Marking Services Inc (MSI) Series MS-970 or approved equivalent. The markers shall be color-coded in accordance with ANSI Standard A13.1. Identification shall bear name of pipe contents and show direction of flow and in the case of gas/air systems, shall indicate pressure of the pipe contents. "Stick-on" type markers are unacceptable. Install markers adjacent to all valves, flanges, fitting, change in piping direction, and both sides of floor and wall penetrations, at each branch take-off and along runs of pipe as required for proper identification but not further apart than 10 feet. Gas piping identification intervals shall be a maximum of 6'-0". Provide piping identification in small areas (closets, storage rooms, etc.) above ceilings where partition walls go to the structure above. Additionally, plumbing system piping identification shall comply with IBC requirements.

Paint all piping and jacket of insulated pipe in Mechanical Rooms and any room with exposed piping with two coats of enamel paint. Colors to be in accordance with ANSI A-13.1 standard. The Contractor shall obtain ANSI A-13.1 and comply with all requirements.

All equipment, smoke detectors, smoke dampers, fire dampers, filter access locations, access panels, motor starters, disconnects, thermostats, humidistats, sensors, other control systems components, control switches, and related devices shall be equipped with engraved laminated plastic nameplates, as described below, but not less than 1/4" high. Filter access locations' identification shall include the size and number of filters required for that specific piece of equipment. Provide identification for all access doors as specified hereinbefore. Refer to Paragraph "Access Panels and Doors" above for requirements.

Labels shall be a minimum of 4" x 3" x 1/16" thick, laminated plastic labels (larger if needed) with 1" high x 1/4" stroke numerals and all capital letters to identify all equipment furnished under this Section. Labels attached to the ceiling grid shall be the same width as the ceiling grid it is attached. Properly adjust lettering height to fit within the smaller width label. Red with white lettering or white with red lettering as required for maximum contrast with color of the equipment. In finished areas where identification is attached to the ceiling grid, the Architect shall select colors of materials. Engrave equipment designation and numbers as shown on plan and drawings on upper half of tag, leaving lower half of tag for future engraving by Owner. Where equipment is typed (HP-A, HP-B, EF-A, etc.) rather than numbered (HP-1, HP-2, EF-1, etc.) the tag shall include the room number(s) of the area served. Room numbers shall



be as designated by the Owner. In absence of Owner's room numbers, numbers shall be as indicated on the architectural plans. Additionally, each piece of equipment (in-line fan, vav terminal, access door, fire damper, etc.) located above the ceiling shall be identified with an engraved laminated label, of the type specified above, and neatly glued to the ceiling tile grid below the item. Neatly attach identification with permanent adhesive.

Permanently affixed warning labels shall be attached to all equipment, on a highly visible location on the equipment, which can be automatically started. The warning label shall read as follows: ***"CAUTION!! This equipment is operating under automatic control and may start or stop at any time without warning. Switch disconnect switch to "OFF" position before servicing or attempting to work on equipment"***. Permanently affixed warning labels shall be attached to all motor starters and all control panels which are connected to multiple power sources utilizing separate disconnect switches. The warning labels shall read as follows: ***"This equipment is fed from more than one power source with separate disconnects. Disconnect all power sources before servicing or working on this item"***.

Fit all valves (except equipment service valves and sprinkler valves) and dielectric unions with engraved laminated plastic valve tags firmly secured with brass jack-chain and S-hooks to valve yoke or stem (not handles) or adjacent pipe. Fabricate tags as 2" x 3" x 1/16" white plastic with beveled corners, engraved both sides with 1/2" high x 1/4" stroke red letters and numerals. Locate numbers at one edge of tag leaving room for future engraving by others. Number tags in sequence, starting with number 1; prefix the number with the trade ("P" for plumbing items and "M" for HVAC/Mechanical items). Also, provide an engraved laminated label, of the type specified above, and glue to the ceiling tile grid below the valve for each valve concealed from view. Provide a valve chart framed under glass or plastic which shows the number and location of each valve and type of service. Locate a valve chart in each equipment room and each janitor closet. Permanently attach each chart to the wall as directed by the Architect. Include a copy of the valve chart in the Owner's Operation and Maintenance Manuals.

Where the tag, label or marker occurs in a plenum (return air) space, the plastic employed shall carry a Class A Flame Spread Rating per ASTM E-84, and shall meet ASTM D-635 (such as Westinghouse Micarta engraving stock).

Access openings to fire dampers and smoke dampers shall be permanently identified on the exterior of the access panel and on the ceiling grid below by a label having letters not less than 3/4" in height and reading: ***"FIRE DAMPER – DO NOT OBSTRUCT ACCESS"*** or ***"SMOKE DAMPER – DO NOT OBSTRUCT ACCESS"***.

- 5.10. Firestopping:** Wherever pipes, ducts, hanger rods, etc. penetrate **any type of construction that extends to the underside of the structure above it, whether it is fire rated or not fire rated** (walls, partitions, or floors), the space between the penetrating member and the building construction shall be sealed with a U.L. certified firestop assembly that provides an effective barrier against the spread of fire, smoke and gas, equal to the rating of the respective wall, partition or floor. Where partitions are not indicated as fire rated, the firestopping assembly used shall provide a minimum of one-hour resistance as specified above. Where partitions do not extend to the structure above, firestopping material is not required in the penetration. Instead, pack the respective openings with insulation and seal on both sides with material equal in characteristics of the penetrated partition.

All fire stop material employed on the project must be same brand throughout. At each

through penetration, attach identification labels on both sides, in location where label will be visible to anyone seeking to remove penetrating items or firestopping. Attach labels permanently to surfaces adjacent to and within 6 inches of edge of the firestop systems so that labels will be visible to anyone seeking to remove penetrating items or firestop systems. Provide metal labels in areas used as return air plenums. Use mechanical fasteners for metal labels. For plastic labels, use self-adhering type with adhesives capable of permanently bonding labels to surfaces on which labels are placed and, in combination with label material, will result in partial destruction of label if removal is attempted. Additionally, secure to wall with metal thumbtack at each corner of the label. Labels shall be Hilti Firestop Identification Labels 00339611, 3M Sticker 98040056289 or approved equivalent. Firestop identification labels shall include the following information on labels:

1. The words: "*Warning--Through-Penetration Firestop System--Do Not Disturb. Notify Building Management of Any Damage.*"
2. Contractor's name, address, and phone number.
3. Through-penetration firestop system designation of applicable testing and inspecting agency.
4. Date of installation.
5. Through-penetration firestop system manufacturer's name.
6. Installer's name.

Carefully coordinate work with types of construction encountered and with Par. Pipe Sleeves above.

- 5.11. Delivery and Storage:** All equipment and materials delivered and placed in storage shall be protected from the weather, humidity and temperature variations, dirt and dust, and other contaminants. See Section 15700 and this Section 15010 for additional requirements for ductwork and equipment.
- 5.12. Dielectric Isolation:** Provide dielectric isolation where dissimilar metals are joined, at supports, etc. For pipe sizes 2" through 6", copper piping flanges shall be drilled to ANSI B 16.5 150/125 Standard and powder coated, with an EPDM insulator adhered to the plate steel flange protruding inside of the steel flange to prevent contact with the copper flange adapter. The copper component of the flange adapter shall be Third Party Classified by Underwriters Laboratories, Inc. Minimum working pressure shall be 300 psi at 272°F.

Wherever any bare metallic piping or conduit is in contact with externally insulated duct or bare sheet metal duct, there shall be dielectric separation provided. The Contractor shall provide 1" thickness, unslit AP Armaflex insulation of sufficient inside tubular diameter to snugly and completely cover the respective piping. The insulation shall extend the full length of the affected area. Where channel shapes are used, orient the open side, down. Refer to Section 15700, Part "Pipe and Miscellaneous Insulation Work" for AP Armaflex material specification.

## **END OF SECTION**

## SECTION 15400

### PLUMBING

#### PART 1. GENERAL & MISCELLANEOUS

- 1.1. **General Provisions:** Section 15010 is applicable in full hereto. **No building materials or products that contain asbestos, formaldehyde, lead or mercury, in excess of limits mandated and defined by OSHA, LEED and the EPA, shall be utilized.**

- 1.2. **Scope:** Include all equipment, material and labor required for a complete operating plumbing system even though every item involved is not indicated. Refer to architectural drawings and verify all plumbing fixtures, locations and mounting heights. Notify the architect prior to bid of any discrepancies. Do not attach any items to other trades' assemblies. Items shall be attached to building structural system. Advisory provisions listed in all Codes referenced in the Contract Documents are mandatory. Where conflicts occur between a Code, Standard, the contract drawings or specifications, the more stringent requirements shall govern and be applicable.

Manufacturers not named in the specifications require prior approval, seven (7) days prior to bid date. Follow procedures set forth in Division 1 of the specifications.

- 1.3. **Warranty:** Guarantee work as set forth in Section 15010 and Division 1. Guarantee in writing to make good without cost any defects in materials and workmanship for one year following the date of acceptance of the project unless specified otherwise. Provide free maintenance and service during the guarantee period. Refer to other parts for additional requirements and extended warranty requirements.

- 1.4. **Site Visits / Inspections:** It is the contractor's responsibility to have the job ready for site visits / inspections when they are scheduled. If the project is not ready for the requested inspection and the Architect, any governmental agency or any other entity requires a re-inspection, the contractor shall pay Zgouvas, Eiring & Associates a re-inspection fee of \$1,500. The payment shall be made directly to Zgouvas, Eiring & Associates 5 days prior to the scheduled re-inspection.

The Contractor is cautioned to carefully review the extensive requirements of Paragraph "Identification" in Section 15010 of the specifications and note that **identification is required to be completed before certain inspections.**

- 1.5. **Miscellaneous:** The Contractor shall carefully examine the contract documents during the bidding phase. Any missing information in the contract documents that is required for obtaining accurate pricing shall be brought to the attention of the Architect, **prior to bid date**, so all may be clarified and/or corrected. Failure to identify and resolve the issues prior to bid shall require the Contractor to provide said items, complete, without additional cost to the Owner or the Owner's Project Design Professionals, using materials and methods specified by, and as directed by, the Owner's Design Professionals.

- 1.6. **Qualifications:** Must be properly licensed and established as a Plumbing Contractor at location of the work and shall maintain locally adequate service facilities. He shall have had previous experience in the satisfactory installation of at least six (6) systems of this type, size and scope.

- 1.7. **Spare Parts:** Manufacturer of any equipment specified shall have a wholesale outlet for readily available replacement parts in the nearest major USA city.
- 1.8. **Electrical Work:** All electric power wiring required for installation of equipment under this Section is specified under Electrical Division. Plumbing Contractor shall furnish and install all controls and control wiring as specified or required to properly complete the installation. Control conduit is specified under Electrical Division or shown on electrical drawings; all other control conduit shall be provided under this Section of the work. Electrical work performed under this Section shall meet requirements set forth in the Electrical Division. Refer to Section 15700, Part 2, Electrical Work and Equipment for requirements not specified in Electrical Division.
- 1.9. **Submittals:** Refer to Section 15010 for requirements.
- 1.10. **Identification:** Refer to Section 15010 for identification requirements. There are specific requirements prior to the above ceiling and final inspections, respectively, that are mandatory. The identification section of the specification is extensive. The Contractor shall refer to Section 15010, review and provide all identification requirements specified. **Failure to comply with this provision will be cause for cancellation of the inspection with all costs of the re-inspection to be borne by the respective Contractor responsible.**
- 1.11. **Firestopping:** Refer to Section 15010 for requirements. **Note that Division 15 firestopping specifications require firestopping of all penetrations regardless of wall/ceiling/floor construction. Refer to Division 1 for additional requirements.** Where there is a conflict between Division 1 specifications and Division 15 specifications, the most stringent requirements shall govern, be applicable and shall be provided.
- 1.12. **Motors:** All motors furnished shall be designed, manufactured, and tested in accordance with the current applicable standards of NEMA, ANSI, IEEE, and ASTM. As a minimum requirement, all motors shall conform to the current applicable sections of NEMA Standard No. MG-1. Motors must meet or exceed The Consortium for Energy Efficiency (CEE) Premium Efficiency full load efficiencies. All motors shall be listed under UL recognized component file as applicable. All motors shall be suitable for installation according to the requirements of NEC. Motors shall be wound for the specified voltage and a 1.5 service factor, 1750 RPM open drip proof construction unless otherwise shown or specified.
- All motors shall be provided with overload protection and phase protection on all legs. Do not run motors until correct overload elements are installed in starters, as applicable. Premium efficient motors shall be **warranted for 36 months** from date of acceptance of the project. Motors shall be by Allis Chalmers, General Electric Goulds, Louis Allis, and Westinghouse or approved equivalent. All motors serving outdoor equipment exposed to weather shall have TEFC motors meeting the requirements set forth previously.
- 1.13. **Bound and Framed Instructions:** Two weeks before final inspection, furnish three complete sets of operating and maintenance instructions, bound in hard cover, indexed and tabbed. The first sheet in the bound instructions shall be a list with each product, name, address and telephone number of:
- Subcontractor or installer.
  - Table of Contents listing all products numbers in the order which they appear in the specifications and label the tab accordingly. Include all "P" numbers also.

- c. Provide a summary page that lists each item with its respective warranty listed
- d. Local source of supply for parts and replacement
- e. Include wiring and control diagrams with explanatory data describing start-up, operation and shutdown; operating and maintenance instructions for each piece of equipment; manufacturer's bulletins and catalog data; parts list and recommended spare parts. Fold in large sheets of drawings.
- f. Provide a list indicating all routine maintenance procedures based on the respective manufacturer's recommended intervals. As a minimum, maintenance shall be grouped and individually tabbed to indicate maintenance operations required:
  - 1. Once a month
  - 2. Quarterly
  - 3. Once every six months
  - 4. Once a year
- g. Provide drawings of system and wiring diagrams, condensed operating instructions and include in binder. All components shall be numbered and identified on diagram.
- h. Record drawings of the Plumbing drawings in hard copy and PDF format.
- i. Provide written results of all tests specified.
- j. Copies of all Site Visit / Inspection Reports including Contractor's written response that items listed were corrected.
- k. Provide domestic water samples testing and results specified.
- l. Provide copy of valve chart required in Section 15010, Identification.
- m. All cleanouts and dielectric unions shall be indicated on record/as-built drawings.

Additionally, the Contractor shall provide all of the aforementioned information, in digital Adobe Acrobat PDF format, on a CD-R CD. The PDF file shall be provided with an embedded index for each item specified. It shall appear in the left hand window of the opened document so that the Owner or his maintenance personnel can "click" on the indexed item and move immediately to that specific item.

## **PART 2. TESTS**

- 2.1. **General:** Perform all tests in the presence of the Architect. Refer to Division One for Fuel, water and power required therefore. In absence of specific testing procedure comply with code requirements and/or nationally acceptable industry standards. Furnish written reports of all tests results specified to Architect.
- 2.2. **Drainage and Vent System:** Plug all openings, fill entire system with water to point of overflow and hold for a minimum of twenty-four (24) hours without pressure loss before inspection. System must remain full during the test without leakage. Each vertical stack with its branches may be tested separately, but any portion tested must have minimum ten-foot head.
- 2.3. **Water Supply System:** Test and secure acceptance of entire system before the piping or hot water storage heaters are insulated or otherwise concealed. Test as follows: disconnect and cap all outlets to plumbing fixtures and all other equipment not designed for the full test pressure. Fill the system with water; apply 150 psi hydrostatic pressure and hold for a minimum of twenty-four (24) hour period without pressure loss. All piping throughout shall be tight under test. Water piping shall remain under normal water pressure during construction except when freezing weather is expected.

- 2.4. **Gas System:** Apply 75 psi air test for a twenty-four (24) hour period without pressure loss through leakage. Test before tanks, equipment, appliances, etc. are connected.
- 2.5. **Fixtures:** Test for soundness, stability of support and satisfactory operation.

### **PART 3. SANITARY PIPING**

- 3.1. **Scope:** Provide a system of soil, waste and vent piping connecting all plumbing fixtures, equipment, etc. to the house sewer, with **consolidated vent connections** extending through the building roof, all as shown on the drawings and as required for complete installation. Rework existing waste roughing as required to facilitate renovation work.
- 3.2. **Utility Connection:** See Division 2. Make sanitary connection as indicated.
- 3.3. **Soil, Waste and Vent Piping Inside the Building Walls and to Points Outside the Building as Indicated:** Provide service weight hub-and spigot cast iron soil pipe and fittings for underground service and hubless for above ground service, meeting ASTM A-74 for hub and spigot and ASTM A-888 for hubless, coated inside and out. Pipe exposed within the building shall be uncoated outside and left clean for painting. Fittings to receive screwed pipe arms shall be recessed drainage type. Soil and waste pipe shall have long sweep connections. All cast iron soil pipe and fittings shall be marked with the collective trademark of the Cast Iron Soil Pipe Institute (CISPI) and be listed by NSF International.

Joints for hub and spigot pipe shall be made with compression gaskets meeting ASTM C-564. Joints for hubless pipe and fittings shall be equivalent to MG couplings meeting ASTM A-48 and C-564, or Anaco Husky SD 4000, super-duty, shielded couplings of Type 304 AISI stainless steel, meeting ASTM C1540 standard or equivalent by Ideal Tridon Heavy Duty HD or Mission Rubber Company, Heavy Weight, shielded.

**Option:** Contractor may use solid wall PVC schedule 40 DWV pipe and fittings meeting ASTM Standard D2665 and 1785 for above ground service and underground service. Use cast iron or PVDF (Polyvinylidene Fluoride) in areas used as return air plenums, return air platforms, and where passing through or within a fire rated assembly. PVDF piping and fittings shall be Orion Super Blue PVDF or equivalent products as manufactured by Enfield, Zurn, GEO or Fisher. The PVDF material shall conform to ASTM D3222 ASTM F1673, ASTM E-84 and UL 723. Pipe shall be marked with its UL Classification to indicate compliance with UL723 (ASTM E84). All fittings shall meet or exceed Schedule 40 dimensions. All vents thru roof shall be cast iron pipe (minimum 18"), secure cast iron VTR to structure with heavy gauge 1-hole strap. All floor drains shall have **cast iron** deep seal p-trap. Piping and fittings above the floor shall be solid wall PVC schedule 40 DWV pipe and fittings with exceptions as specified hereinbefore. **The use of "Cellcore" piping is expressly forbidden.**

- 3.4. **Laying Out Work:** Vents from any fixture, when connected to a vent line serving other fixtures, shall be extended at least 6 inches above flood level rim of highest of such fixtures to prevent use of vent lines as a waste. Make changes in direction by appropriate use of 45 degree Y's, 1/2 Y's, or long sweep 1/4, 1/6, 1/8 or 1/16 bends. Sanitary T's or short 1/4 bends may be used on vertical stacks or drainage lines where change in direction of flow is from horizontal to vertical; except that long-turn TY's shall be used when two fixtures are installed back to back with common drain. Straight T's, Ells and Crosses may be used on vent lines. Make no change in direction of flow greater than 90 degrees. Where different sizes of drainage pipe or fittings are

connected use standard increasers and reducers of proper size. Do not reduce size of drainage piping in direction of flow. Drilling and tapping of house drains, soil, waste or vent pipes, and use of saddle hubs and bands are prohibited. **All plumbing vents through the roof shall be located a minimum of 10'-0" away from all outside air intakes.** Coordinate all plumbing vents locations with the HVAC plans.

Do not begin work until elevation of final connection point is verified and grading of entire system can be determined (even if final connection is specified under another Section).

- 3.5. **Hangers and Sway Bracing:** Refer to Section 15010 for requirements.
- 3.6. **Grading:** Uniform and not less than 1/8" PLF for pipe 4" and over, and not less than 1/4" PLF for 2" and 3" piping.
- 3.7. **Roof Flashing:** Roof penetrations are to be flashed by the roofing contractor, using materials as recommended by the roofing manufacturer and approved by the Architect. Coordinate work with Roofing Contractor. Offset vents as required to clear gravel guards and flashing courses. Extend vents 6" to 8" above roof level.
- 3.8. **Waste Arms:** Type K copper or IPS brass pipe typical; Schedule 40 PVC or IPS brass pipe at urinals.
- 3.9. **Test Fittings:** Not shown on the drawings; provide where required for partial tests.
- 3.10. **Miscellaneous Joints:** Where cast iron pipe joins clay or transite pipe, make joint by caulking with jute and filling (at one pouring) with hot compound meeting FS SS-C-608.

Use slip joints and unions only upstream from a trap seal.

- 3.11. **Acid-Resisting Soil, Waste, and Vent Piping (AR):** All piping and fittings shall be a flame retardant, corrosive waste drainage system equal to Zurn Flame Retardant polypropylene Schedule 40 pipe and fittings. Provide fusion joints below slab and mechanical joints above the slab. Joints and piping installation shall be in strict accordance with manufacturer's recommendations. Pipe shall be marked with its UL Classification to indicate compliance with its required UL listing. Equal products as manufactured by Enfield, Orion and GSR will be accepted.

Acid resisting soil, waste and vent piping located in the return air plenum, return air platforms, and similar spaces shall conform to ASTM F1673, ASTM D3222, UL 723, ASTM E84 25/50 requirements for flame spread and smoke and made of **PVDF (Polyvinylidene Fluoride)**.

All PVDF pipe and fittings shall be joined using fusion method below the slab. No-Hub mechanical joint method with plain end fittings and No-Hub couplings shall be provided above the slab. Each No-Hub coupling will have an outer band of 300 series stainless steel with 5/16" bolts, nuts and washers plated to meet a 100-hour salt spray test per ASTM B117. The No-Hub joint will conform to the requirements of ASTM F1673. PVDF piping shall be marked with its UL Classification to indicate compliance with UL723 (ASTM E84). All fittings shall meet or exceed Schedule 40 dimensions.

All PVDF piping and fittings installation shall be in strict accordance with the Manufacturer's recommendations. Piping and fittings shall be Orion Super Blue

PVDF (Polyvinylidene Fluoride). Equivalent products as manufactured by Enfield, GEO, Zurn and Fisher will be accepted. Orion is the basis of design.

## **PART 4. DRAINAGE SPECIALTIES**

**4.1. Equivalent Products:** Specialties by J.R. Smith, Josam, Sioux Chief, Zurn, Watts or Wade.

**4.2. Cleanouts:** Provide in sanitary piping at all changes in direction, at ends of branches, at intervals not exceeding 40 feet on straight runs, and elsewhere as shown. Cleanouts shall be full opening type and completely accessible without obstruction. Size same as lines in which they occur, but not larger than 4 inch. Tees and extensions shall be of same weight as soil pipe. Plugs countersunk or raised head type with lead-free seals. **Provide flashing clamps and flashing flanges in all areas where cleanouts are accessible from floor below or above, as applicable.** Except as noted, catalog numbers are from J.R. Smith. **All cleanouts shall be indicated on the record/as-built drawings.**

**In Tile Floors:** 4051, adjustable, cast iron body with cadmium plug and satin finished square scoriated Nikaloy top; where soft tile occurs provide 4160 recessed square Nikaloy cover.

**In Concrete Floors:** 4237, adjustable head, cast iron head and ferrule with cadmium plug, round loose-set scoriated tractor cover.

**In Outside Lines:** 4263L-NB cast iron head and ferrule with bronze plug. Terminate at grade in 18"x18"x12" deep concrete pad with tooled edges or flush in pavement as applicable.

**In Accessible Unfinished Spaces:** 4400 or 4510 cast iron with cadmium plug, as appropriate.

**In Finished Walls:** 4530 cast iron cleanout tee with cadmium plug and 16 ga. stainless steel, flat, wall plate cover. Where distance from plug to finish wall will exceed 4 inches provide extension from sanitary tee to bring plug within 4 inches.

**In Terrazzo Floors:** 4185, adjustable cast iron head and ferrule, cadmium plug and round brass terrazzo cover and rim.

**In Carpeted Floors:** 4020X, adjustable head, cast iron, round polished bronze top with carpet clamping device.

**4.3. Typical Drains:** Size outlets same as pipe to which they connect. Install temporary closures during construction. Each drain connected to sanitary sewer shall have **cast iron** deep seal P-trap. Provide types as scheduled below. Where indicated on the drawings and elsewhere required by local and/or state Codes. Provide trap primer connection on floor drain and trap primer as specified below.

Where drains occur above finished spaces, furnish with clamping collar to secure waterproof membrane.

**Floor Drain (FD):** Series 2010B two-piece cast iron drains with caulk type outlet and adjustable Nikaloy strainer and rim. Strainer tops for 2" drains 5" x 5", for 3" drains 6"



x 6", for 4" drains 8" x 8". Provide trap primer connection as indicated on the plans.

**Mechanical Room Drain (MFD):** Series 2230 cast iron drain with caulk outlet, sediment bucket and cast iron grate.

## **PART 5. WATER PIPING**

- 5.1. Scope:** Connect to water main as indicated and extend to all plumbing fixtures, hose bibbs, water heaters, etc.; and to HAC, kitchen, laboratory, laundry and special equipment as indicated or required. Rework existing water roughing as required to facilitate renovation work. Refer to Section 15010 for hanger rods, hangers, spacing and uni-strut support assembly requirements.
- 5.2. General Workmanship:** Cut accurately to measurements established at site and work into place without springing or forcing, properly clearing all openings, finished ceilings, etc. All piping not in an accessible attic that contain valves and other items which may require maintenance access shall be located no more than 24" above the finished ceiling and no more than 10'-0" in areas without ceilings. Piping located in attics shall be supported such that maintenance access can be accomplished without the use of a ladder. Route all piping through previously built in sleeves and avoid excessive cutting or other weakening of the structure. Make changes in direction and size with fittings. Cap or plug open pipe ends during installation to keep out foreign material. Make connections carefully to insure unrestricted flow, eliminate air pockets, and to permit complete drainage of the systems. Supply piping to fixtures, faucets, hydrants and flush valves shall be anchored to prevent movement. Install all buried piping with at least 36" of earth cover. All piping below slab-on-grade construction shall be installed in plastic jacket equivalent to Plasti-sleeve, as manufactured by Plastic Products Co. of Stanton, California.
- 5.3. Freeze Protection:** Do not install piping in spaces subject to freezing. Install piping within building insulation envelope.
- 5.4. Grading:** Grade pipe upward from source to facilitate drainage and air relief. Where low points are required because of long runs or where sections may be valved off, provide with 3/4" globe valve and hose nipple for drainage at low point. Make all connections to risers and fixtures from top of mains.
- 5.5. Nipples:** Of same material as pipe in which they are installed; provide extra strong when unthreaded portion is less than 1 inch long.
- 5.6. Piping and Fittings:** Typical lines to be of copper tubing meeting ASTM B-88, Type "L" hard above ground and Type "K" soft below ground. Make up joints with sweat fittings of wrought copper, and 95-5 or Harris "BRIDGIT" lead free solder complying with ASTM B-32-89. Surfaces shall be cleaned with steel wool or emery cloth before applying. Do not make joints or branch connections below a slab on grade. **All 90° and 45° elbows and fittings shall be full radius, long sweep, with radius 1.5 times the pipe diameter. All offsets of water piping shall be made with 45° fittings in lieu of 90° fittings wherever possible.**
- 5.7. Hangers and Sway Bracing:** Refer to Section 15010 for requirements.
- 5.8. Utility Connection:** See Division 2. Make water connection as indicated.

- 5.9. **Water Pressure:** Supply system is designed for static pressure of 50 to 75 psi. Gauge city water supply adjacent to building to verify that pressure is within those limits. Submit report in writing. Provide water pressure reducing valve, if required, to meet designed water pressure. See Water Piping Specialties for pressure reducing valve specification.
- 5.10. **Disinfection:** New potable water systems shall be purged of deleterious matter and disinfected prior to utilization. The method to be followed shall be that prescribed by the health authority or water purveyor having jurisdiction or, in the absence of a prescribed method, the procedure described in either AWWA C651 or AWWA C652, or as described in this section. The pipe system shall be flushed with clean, potable water until dirty water does not appear at the points of outlet. The system or part thereof shall be filled with a water/chlorine solution containing not less than 50 parts per million of chlorine, and the system or part thereof shall be valved off and allowed to stand for 24 hours; or the system or part thereof shall be filled with a water/chlorine solution containing not less than 200 parts per million of chlorine and allowed to stand for 3 hours. Following the required standing time, the system shall be flushed with clean potable water until the chlorine is purged from the system. Upon completion of the disinfection procedure, the Plumbing Contractor shall engage the services of the Alabama Department of Public Health Clinical Laboratories or a certified, licensed, testing laboratory to provide a bacteriological water analysis to include a standard heterotrophic plate count (HPC), microbial, bacterial, pathogens and coliform count. Test a minimum of two (2) samples of domestic water from two (2) separate locations within the facility. Test each sample for Coliform Present, Fecal Present and E. Coli present. Test locations shall be selected by the Architect and shall be noted on the Testing Laboratory's report. If the lab results indicate positive results for Total, Fecal, or E. Coli coliform per 100 ml respectively, or an HPC greater than 500 CFU/mL, the Contractor shall disinfect the system in its entirety, as specified above, and obtain new test results as outlined hereinbefore until levels are reached as required by AWWA C651 or AWWA C652.
- Prior to the final site visit**, the Contractor shall provide to the Architect, certified test results on the testing facility letterhead. The report shall indicate the name of the project, the locations from where the samples were taken, the testing laboratory findings and indication whether the water is safe for consumption. **No Certificate of Occupancy will be provided to the Owner without the required lab results indicating the potable water system is safe for consumption.**
- 5.11. **System Drainage:** Provide valves and hose nipple to allow for drainage of all risers and other system low points.

## **PART 6. WATER PIPING SPECIALTIES**

- 6.1. **General:** Seal the opening where the stem, nipple, etc., penetrates the insulation as required to maintain the continuity of the insulation and vapor barrier. All valves in potable water distribution shall be "lead free" as required by Code, Regulations and Standards.
- 6.2. **Unions:** 150 lb. rated; cast brass ground-joint type in copper pipe, galvanized malleable iron in wrought iron or galvanized pipe. Provide in all sizes of threaded pipe, and in sweat-jointed pipe over 1 inch, to facilitate easy repairs. In such lines install adjacent to water heaters, pumps, tanks, etc. into which piping is terminated; and on at least one side of valves, cocks, strainers, etc. and other devices which occur in piping runs.

- 6.3. **Dielectric Unions:** Provide dielectric unions between ferrous and non-ferrous piping as required, including piping and water heater stubs where different. Dielectric unions shall be constructed using lead free materials as required by all Governmental Agencies, Codes and Standards and shall comply with ASTM 1545. Dielectric unions shall be Watts Series LF or equivalent by Mueller or Matco Norca. Where unions are installed, they shall be provided with brass tag and identified as specified in Section 15010 and indicated on the record drawings. Contractor shall provide a ball valve on both sides of each dielectric union to allow for proper maintenance of the union.
- 6.4. **Valves:** Provide where shown and/or specified, including all fixtures or equipment not furnished with stops. **All valves shall be bronze, lead free** and shall be the product of one American Manufacturer. Nibco units as indicated below. All valves shall be rated equivalent to Nibco Figure numbers. Arrange and install valves to be readily accessible for servicing. Where piping is insulated, provide thermal insulating T-handles with preformed holes for identification tags. Coordinate handle height requirement with specified insulation thickness. Provide height as required to clear insulation and properly operate without causing damage to piping insulation. All handles shall comply with UL 2043 and shall be UL listed for installation in air-handling spaces (return air plenums). Handles shall be Nibco Nib Seal, Jomar Long Neck T-Handle, Apollo Thermal seal or Hammond/Milwaukee Valve Insulator MS.
- 6.5. **Gate Valves 2" and smaller:** #S-134 Class 150 WSP bronze solder-joint #T-134 for threaded pipe. **Over 2":** F-617-0 iron body flanged type with bronze trim, 125 WSP.
- 6.6. **Globe Valves 2" and Smaller:** #S-235-Y bronze solder-type with replaceable disc, T-235-Y for threaded pipe, 150 WSP. **Over 2":** F-718-Y iron body flanged type with replaceable disk, 125 WSP.
- 6.7. **Check Valves 2" and Smaller:** T-473-B bronze threaded, Y-Pattern swing check, 200 WSP. **Over 2":** F-918-B iron body flanged type with bronze trim, 125 WSP.
- 6.8. **Ball Valves for Water Piping in Size 1/2" through 3":** Valve shall be "Lead-Free" forged bronze, 600 PSI CWP, 150 PSI WP, two-piece body, full port, blowout proof stem, stainless steel ball, stainless steel stem, PTFE seats, plastic covered handle. Valve shall meet NSF, ANSI, FM, UL and MSS SP-110 standards. Note that ball valves are also required on both sides of each dielectric union. Approved valve manufacturers are Nibco, Watts, Hammond, Apollo and Kitz.
- 6.9. **Strainers:** 2" and smaller shall be Crane No. 988-1/2, iron body screwed, Y-Pattern, 125 WSP sediment separators with a 20 mesh model screen. Over 2" shall be Crane No. 989 1/2 of same construction as above. Equivalent strainers by Mueller, Chase, Nibco, Watts or Jenkins will be approved.
- 6.10. **Thermometers:** "Any angle" type with 9 inch scale and suitable temperature range, as manufactured by Trerice type BX. Thermometers shall be "blue liquid" actuated with Phenol Condensate, and lead free cast aluminum or lead free brass cases and 6" socket with extension neck. Locate for convenient reading. Equivalent product by Blue Ribbon, Weskler, March or Maxwell Moore will be accepted.
- 6.11. **Wall Hydrants (Typical):** Bronze, nickel plated, quarter turn, self-draining, non-freeze hydrant with hose connection, integral vacuum breaker, loose "T" handle key, stainless steel recessed box, with full 180°, nickel bronze face, integral cylinder lock, and "Water" inscribed on the face. Seal all interior joints, seams, gasket seams/closures including around the hydrant box flange with an appropriate sealant

recommended by a sealant manufacturer. Wall hydrant shall be JR Smith 5509 QT or approved equivalent. Install approximately 24 inches above finished grade.

- 6.12. Water Hammer Arrestors:** Certified by the American Society of Sanitary Engineers and in compliance with current edition of ASSE 1010, ANSI A112.26.1M, Plumbing and Drainage Institute Standard PDI-WH201, heavy-duty construction and designed for a minimum 150 PSI working pressure. Arrestors shall consist of a Type 304 stainless steel casing and bellows. The device shall be pre-charged and sealed at the factory. Install on both hot and cold-water branch lines in an upright position as close as possible to the valve or valves being served. Arrestors shall be installed at all solenoid, remote operated or quick closing valves and at each plumbing fixture or battery of plumbing fixtures as recommended by the Manufacturer. Plumbing Contractor shall provide a dielectric union at connection of this device to the copper water piping. Manufacturer shall size and determine location of the arrestors. Arrestors shall be Zurn Z1700, J.R. Smith Hydrotrol Series 5005-5050, Watts Series SS or MIFAB Series WHB.
- 6.13. Automatic Drain Trap Primer Units Where Water Closets or Lavatories Occur:** Units shall be provided for all floor drains and indirect drains. Trap primers shall comply with International Plumbing Code and local codes. Allow for required modifications to meet local codes. Units shall be accessible for service. Provide required piping and drainage. Provide trap primer line to every floor drain, hub drain and floor sink. Provide isolation valve for all trap primers. Equivalent to Sloan VBF-72-A1.
- 6.14. Automatic Drain Trap Primer Units:** Units shall be provided for all floor drains and indirect drains. Automatic type trap primers shall be provided **ONLY** where there are no water closets or lavatories in the area. Units shall be lead-free and self-contained within a surface or recessed mounted panel as shown on the plans. Housing shall be a NEMA 1, UL 50, 16 gauge steel enclosure. It shall contain a distribution unit with copper waterway, brass atmospheric vacuum breaker, transformer, brass ball type stop valve, slow closing solenoid valve with integral strainer, anti-scaling copper header, and complete with all required accessories. Where units are mounted on fire rated wall, it shall be within a fire rated housing. Units shall comply with International Plumbing Code and local codes. Allow for required modifications to meet local codes. Units shall be accessible for service. Provide required piping and drainage. Provide trap primer line to every floor drain, hub drain, floor sink, etc. as shown or required by Code. Provide isolation valve for each trap primer line. Unit shall be Zurn Series Z1020XL, Precision Plumbing Products, Inc. Series MPB-500-115V.
- 6.15. Pressure-Reducing Valve and Strainer:** Zurn/Wilkins 500XL-YSBR or equivalent by Apollo or Watts. Provide full size valved bypass around PRV, two pressure gauges, hose bibb and a valve and union on each side of PRV. Provide if required to meet designed water pressure (not to exceed 75 psi).
- 6.16. Stop and Waste Valve:** Nibco Series 700.
- 6.17. Backflow Preventer:** Provide where indicated or required by International Plumbing Code.

Units shall be Watts LF009 or equivalent by Apollo or Wilkins complete with strainer, double check valves and ball valves.

The backflow preventer shall be tested at job site by an individual certified by the American Backflow Prevention Association (ABPA). Testing procedure shall be as

published in the Manual of Cross-Connection Control, Tenth Edition by the Foundation for Cross-Connection Control and Hydraulic Research. Furnish test results to the Architect. Testing results shall include the tester's name, ABPA certificate, certificate number and expiration date.

## **PART 7. PIPE HANGERS AND SUPPORTS**

- 7.1. **General:** Refer to Section 15010. Refer to PEX-A requirements where applicable
- 7.2. **Painting:** Clean and paint with two coats of black latex paint all exposed ferrous metal parts of hangers, unistrut and other assemblies used for supporting of ducts (except duct straps/band hangers), piping and plumbing related items in mechanical rooms, crawl space, above ceilings, etc. Include black steel pipe, uncoated cast iron pipe, hangers, brackets, etc. **Bare, unprotected/uncoated steel or galvanized hangers, brackets, unistrut, supports, etc., are not allowed.** In lieu of painting, the Contractor may substitute factory painted, powder coated or epoxy coated items to prevent rusting of the items listed above. All paints and coatings shall have a fire hazard rating not to exceed 25 for flame spread and 50 for fuel contributed and smoke developed as determined by ASTM E84. Also, see specification section, "Identification" for additional requirements.

## **PART 8. PIPE INSULATION**

- 8.1. **General Provisions:** All work by experienced insulation subcontractor whose primary business is the installation of insulating materials in accordance with insulation manufacturers' recommendations. Piping must be clean, dry and pressure tested before covering is applied. Size pipe hangers to fit insulated pipe size. **No installation of pipe hangers for insulated piping will be allowed to be in contact with piping or penetrate the piping insulation. Piping insulation shall be continuous through partitions/sleeves and shall not be cut away for installation of clamps, etc.** Refer to details on plans and Section 15010, "Pipe Hangers and Supports" for additional requirements. Cover fittings, valves and flanges with insulation material as hereinafter specified to same thickness as adjacent pipe covering except screwed unions in hot piping and other specifically named items. Neatly bevel covering edges adjacent to unions and other points of termination and seal ends. All insulation material (including coatings, mastics, jackets and adhesives) shall have a composite flame spread rating not to exceed of 25 (with no fuel contributed and smoke developed) as determined by ASTM E-84, NFPA 255 and UL 723.
- 8.2. **Scope:** Insulate all hot and cold water piping except that below grade, and excluding plated brass fixture connections. All piping shall be routed within the building insulation envelope to prevent freezing. Insulate rainwater drainage system as noted in that Part. Insulate all p-traps located in return air plenums, horizontal overhead drain lines, including p-traps, from mechanical room floor drains, ice machine drains, cooler drains, condensate drainage piping located in return air platform plenums and other condensate receiving drains, to the respective riser same as cold water piping. Include all overhead floor drain sumps and vertical pipe connection.
- 8.3. **Insulation:** No installation of pipe hangers for insulated piping will be allowed to be in contact with piping or penetrate the piping insulation. Refer to details on plans for additional requirements. Size hanger loops to fit over insulation. Glass fiber insulation, CertainTeed Snap-on, ASJ-SSL with Kraft-foil-laminated jacket, or

equivalent by Owens-Corning or JM. Provide 3" wide jacket material butt strips at joints and at mid-points of lengths. Apply by sealing longitudinal jacket flaps and jacket bands (butt strips) with adhesive and with insulation staples on 4" centers. Insulation staples shall be coated with a vapor retarder coating, PVDC adhesive tape or greater than 3 ply laminate jacket (less than 0.0001 perms) adhesive tape.

Cold Water/Domestic Water Insulation thickness: 1"

Hot Water Insulation thickness: 2"

- 8.4. Insulation for Piping Within Concrete Block Walls:** Insulate with 1" or 2" thickness insulation for the respective piping as specified above. Insulation shall be black, flexible foamed, elastomeric, closed cell pipe insulation with a fire hazard rating not to exceed 25 for flame spread and 50 for fuel contributed and smoke developed as determined by ASTM E84. It shall be GreenGuard certified tubular insulation with Microban antimicrobial protection. Insulation shall have a 'k' factor of not more than 0.26 at 90°F mean temperature and a water vapor transmission rate of 0.05 perm-inches or less. Slip insulation onto pipe prior to installation. **Longitudinal cutting of the insulation is prohibited. Do not stretch or bend insulation, nor slide insulation over sweat fittings.** Insulate sweat fittings with miter-cut pieces of insulation as recommended in Armaflex installation instructions, the same size as on adjacent piping. Seal all butt joints with Armaflex BLV, Black, low VOC, air drying contact adhesive. After gluing joints, wrap joint with 2" wide, 1/8" thick AP/Armaflex self-adhering tape. Insulation shall be AP Armaflex or equivalent by K-Flex or Aerocel AC EPDM.
- 8.5. Fittings:** Insulate with Fiberglas insulation mitered to fit snugly or with PVC covers with integral **rigid** fiberglass insulation of the same thickness and density as the adjacent pipe insulation. Premolded PVC covers shall have a flame spread index of 0-25 and a smoke developed index of 0-50 when tested in accordance with ASTM E84.
- 8.6. Exposed Ends:** Finish open ends of sectional covering by rounding off with cement, and sizing with fiberglass cloth jacket around the pipe and finish with Foster 30-36 mastic cement.
- 8.7. Partitions and Floors:** Refer to Section 15010 Pipe Sleeves. In any case insulation shall extend through floors, partitions and walls and firestopped. Note that Section 15010, Firestopping, requires firestopping of all penetrations, regardless of rating. Refer to Section 15010, Firestopping, for specifics and additional requirements
- 8.8. Underground Hot Water Piping:** Insulate with 3/4" thickness Armstrong Armaflex or equivalent pipe insulation. Seal all joints with Armaflex 520 sealer.
- 8.9. Electric Water Coolers:** Insulate drain connections and traps with 1/8" thick insulating tape by AP Armaflex, K-Flex or Aerocel AC EPDM.
- 8.10. At Hangers:** Provide 12" long, 22 ga. galvanized sheet metal, half round saddles, to protect all piping up to 1 1/4". Provide a preformed, pre-insulated saddle assembly consisting of an integral metal saddle and insulation for piping over 1 1/4". The assembly shall be a 360 degree section of 3.0 pcf density polyisocyanurate pipe insulation. The assembly shall have a 6-mil thickness, .01 perms rated industrial grade vapor retarder film. The insulation shield shall be a G-90 galvanized steel, 360 degree self-clamping and be integral with the insulation. The assembly shall also be provided with an insulation lock joint longitudinal seam. The assembly shall meet the requirements of ASTM D1622 for insulation density, ASTM C518 for thermal

conductivity, ASTM D1621 for 50 PSI compressive resistance, and ASTM D374. The insulation jacket shall have a hazard rating not to exceed 25 flame spread and 50 for fuel contributed and smoke developed as determined by ASTM E-84, NFPA 255 and UL 723. The assembly shall be Buckaroos, Inc, Model 3300E or equivalent by Thermal Pipe Shields, Inc or Pipe Shields, Inc.

- 8.11. **Painting:** Paint exposed insulation after insulation is completed as specified in Section 15010.
- 8.12. **Identification:** Refer to Section 15010 for identification of piping systems.

## **PART 9. NATURAL GAS DISTRIBUTION SYSTEM**

- 9.1. **Scope:** Make house supply connection as indicated and extend to all gas fired equipment as well as other locations required.
- 9.2. **Utility Connection:** Arrange with local Gas Company for service, with meter to be located as indicated. Meter and all piping upstream by Gas Company. Pay for all costs in connection with installation. Provide main cut-off valve and dielectric insulating union in service lines to building.
- 9.3. **Installation Generally:** In accordance with local gas code, requirements of local utility company, AGA and NFPA Standard #54. Cut pipe accurately to measurements established at site and work into place without springing or forcing. Avoid runs through solid walls or floors. Route through previously built in sleeves and avoid excessive cutting or other weakening of the structure. Ream all pipes to remove burrs. Make changes in direction and size with fittings. Make take-offs from top or sides of mains, not from bottoms. Cap or plug open pipe ends during installation to keep out foreign material. Lay out and grade work (1/4" in 15 feet min.) to avoid trapped lines; where unavoidable provide 4 inch drip leg with removable cap at low point. Provide complete system testing per NFPA 54. Provide combination stop valve and insulating union at each point piping drops to underground or rises above grade from underground.

Use joint compound sparingly, applying to male threads only.

Provide unions and hangers same as specified under Water Piping Specialties. Refer to Section 15010 for pipe hangers, supports, rods and uni-strut requirements.

- 9.4. **Interior and Above Grade Piping:** ASTM A53, Grade B, seamless or ERW, Schedule 40 black steel pipe with black malleable iron screwed fittings for 2" and smaller, 2-1/2" and larger, ANSI B16.25 butt-weld. Welders shall be American Welding Society (AWS) certified. **Welders shall submit current AWS certificate** and shall affix AWS Certificate number and identification adjacent to each weld made.
- 9.5. **Lines Below Grade:** Republic X-Tru-Coat steel pipe with plastic coating
- 9.6. **Lines Under Slab or in Unvented Spaces:** Install in mill coated vented steel pipe in accordance with International Gas Code. Vent pipe shall be equivalent to Republic X-Tru-Coat steel pipe with plastic coating.
- 9.7. **Electrical Bonding and Grounding:** The gas piping system shall be bonded to the electrical service grounding electrode system or, when provided, lightning protection

grounding electrode system, at the point where the gas service enters the building, all as required by NFPA 54. The bonding jumper shall not be smaller than 4 AWG copper wire and shall be a maximum of 75 feet in length. Devices used for the bonding connection shall be listed for the application in accordance with ANSI/UL 467, Grounding and Bonding Equipment. Bonding of gas piping systems is electrical work and shall be provided by a qualified licensed Electrical Contractor who is recognized by the Authority Having Jurisdiction as capable of doing such work. Point of connection shall comply with the current edition of NFPA 70, National Electric Code. **It is the responsibility of the Plumbing Contractor to engage a qualified Electrical Contractor to provide the bonding and grounding as specified.**

- 9.8. **Connections:** Provide plug cock and pipe union in supply connection to each piece of equipment, RESUN #1430 semi-steel or equivalent for sizes 2" and smaller and 1431 flanged for sizes over 2". Where final connection is specified under another Section, cap off within 3 feet of input point. Provide flanges for piping 2 1/2" and larger, 150 lb., black forged steel, welding ASTM A181, Grade I, 1/16" raised face. (Use flat face when connected to flat face companion flange). Provide service cut-off valve in each service line to the building. Provide engraved brass valve tag at each cock identifying gas pressure.
- 9.9. **Gas Pressure Regulators:** Standard service type gas regulators meeting job and Gas Company requirements with automatic safety shut-off valves, cast iron body, regulators meeting job and Gas Company requirements, with automatic safety shut-off valves equal to Security Corp, aluminum orifice and chromate covered casting, e-coated or primed with enamel topcoat and tamper proof seals. Regulator shall be equivalent to Security Corporation or equivalent by Sensus, Emerson/Fisher, Pietro Firoentini or American as required by job conditions. Verify supply (inlet) pressure prior to selecting regulators. All regulators shall be vented to the outside with copper line (up to 1/2" relief valve discharge outlet) and steel pipe as specified below for gas piping (1/2" and larger relief vent discharge outlet) full size of regulator valve discharge fitting. Where total vent piping exceeds 30'-0" in total equivalent length (each elbow equals 4'-0" equivalent length), vent line shall be increased one nominal pipe size. Terminate vent line with 90° elbow pointing down toward the ground. Termination shall be a minimum of 6'-0" horizontally from any ignition source, window, outside air intake, sidewalk or other opening into the facility and a minimum of 7'-0" above finish grade. Provide insect screen over open end of vent line to prevent the entry of insects and debris. **Internally vented regulators are not allowed.** Provide brass engraved tag at each regulator identifying the contents of the associated piping and the contents entering and leaving gas pressure.
- 9.10. **Shutoff Valve:** Main gas shutoff valve controlling the gas piping system shall be easily accessible for operation and shall be installed in each service line as indicated, protected from physical damage, and marked with a metal tag to clearly identify the piping system controlled and pressure of the gas line.

## **PART 10. WATER HEATING EQUIPMENT**

- 10.1. **Water Heater:** RHEEM Series EGSP or approved equivalent, glass-lined tank with heating elements designed for current shown on the Electrical Drawings, copper dip tube, drain pan, storage capacity not less than indicated on the drawings, UL labeled and covered by a 3 year manufacturer's warranty. Equivalents by A.O. Smith or Lochinvar will be acceptable.
- 10.2. **Power Wiring:** Specified under Electrical Division.



- 10.3. **Circulating Pump:** Furnish and install, as shown on the plans an all lead-free bronze (0.25% or less lead content of all wetted surfaces) or stainless steel construction, pipe-mounted centrifugal pump with high efficiency ECM motor in eight (8) modes of control and stainless steel flanges. Pump shall be ETL or UL listed and be NSF 372 compliant. Provide a strap-on aquastat and wire to control the pump through a 7-day program clock which shall be programmed to the Owner's requested operating schedule. Clock shall be equivalent to Grasslin digital 2-72 with 24 hour minimum battery back-up power. Provide required control wiring. Pump power shall be as shown on the electrical plans. Pump shall be Armstrong Compass series or equivalent by Taco or Grundfos.
- 10.4. **Relief Valve:** Provide Watts, Apollo or McDonnell and Miller properly sized, ASME T & P relief valve on the water heater with copper relief line piped to nearest floor drain or to outside. Do not pipe/connect relief discharge line and auxiliary drain pan lines together.
- 10.5. **Expansion Tank:** Provide diaphragm type designed for 150 PSIG working pressure. Tank shall have a minimum acceptance as recommended by heater manufacturer. Expansion tank shall be supported at the wall by a QS-5 or QS-12 Quick Strap tank stainless steel and galvanized assembly as manufactured by HoldRite or approved equivalent.
- 10.6. **Auxiliary Drain Pan:** Provide 1 1/2 "deep, 24 ga. (0.025" thickness) galvanized steel or 18 ga. (0.04") thickness aluminum auxiliary drain pan with seamless, welded or soldered water tight joints, of sufficient size and shape to receive drippings. Provide 3/4" copper drain line in bottom of pan to floor drain with dielectric separation. Do not pipe relief discharge line and auxiliary drain pan lines together.
- 10.7. **Wall Mounted Water Heater Stand:** Where applicable, in lieu of the assembly indicated on the plans, the Contractor may provide for water heaters up to 50 gallons of capacity and are indicated to be mounted from the wall, a factory fabricated unit with watertight pan constructed of 18 ga. galvanized metal and integral metal 1 1/4" auxiliary drain, 16 ga. galvanized C-brackets, 12 ga. galvanized 45 degree brackets with low carbon steel, zinc plated, threaded rods as required for a 300 lb. load with 2x safety factor. Provide dielectric fitting between galvanized drain outlet and copper auxiliary drain line specified. Assembly shall be QuickStand SWHP-WM wall mounted equipment platform as manufactured by Holdrite or approved equivalent. Note that where the assembly is required, the auxiliary drain pan specified above is not required. The 1" thick, heat resistant neoprene pad under the respective heater is still required. Installation shall be as recommended by the Manufacturer.

## **PART 11. FIXTURES SUPPORTS, CONNECTIONS AND MOUNTING HEIGHTS**

- 11.1. **General:** All fixtures including lavatories, urinals, water closets, electric water coolers, etc., must be securely fastened to the walls or floor. **Coordinate all mounting heights with Architectural plans prior to rough-in.**
- 11.2. **Wall Mounted Fixtures:** Support all wall mounted fixtures except water closets, with 3/16" thick 3 1/2" high plates full length of fixture, mounted behind wall. Where fixtures are back to back on a solid wall, mount with bolts from fixture hanger to fixture hanger. Do not use toggle bolts or expansion bolts except as noted.

Hangers for wall supported water closets are specified with fixtures.

Where fixtures are mounted on solid (single wythe) walls finished both sides, install fixtures with plated toggle bolts.

Where fixtures are mounted on wood or light gauge steel studs, employ pressure treated blocking of 2 x 10 nominal size well secured into stud line with non-corrosive, dielectric separation fasteners. Fit behind stud flanges, using especially placed studs as required.

Provide chair carrier where specified with plumbing fixture.

- 11.3. Floor Connections:** Provide cast iron or galvanized malleable iron floor flanges at least 3/16" thick, screwed or caulked to drainage pipe. Bolt the connection and make tight to fixture with plumbing fixture setting compound, wax setting ring or polyethylene gasket flange. Offset flanges for water closets are not allowed.
- 11.4. Water Supply Connections:** Provide lead-free brass nipple from water riser to fixture stop valve threaded connections. Steel pipe is unacceptable. Exposed portion of nipple shall be chromium plated. Stops' risers shall be lead-free, threaded with chrome over copper pipe. Compression fittings are not allowed.
- 11.5. Waste Arms to Fixtures:** As specified hereinbefore. Where copper or brass pipe is specified, all joints downstream from the trap shall be soldered joints.
- 11.6. General Mounting Heights - Coordinate With Architectural Plans Prior to Roughing in Fixtures:**

Urinals (unless indicated otherwise) – 24" to lip  
Urinals for ADA adults – 17" to lip

EWC for ADA adults – 34" to spout

Lavatories (unless indicated otherwise) – 31" to rim  
Lavatories designed for men – 32" to rim  
Lavatories for ADA – 34" to rim

EWC (unless indicated otherwise) – 40" to rim  
Water closets (ADA) 17" to 19" to top of seat

## **PART 12. SCHEDULED FIXTURES AND MISCELLANEOUS ITEMS**

- 12.1. Acceptable Manufacturers:** Fixtures listed are from American Standard (AS) and Elkay Catalogs. Equivalent products by Toto, Kohler, Zurn, Beneke, Just or Sloan will be accepted.
- 12.2. Fixture Trim:** Exposed metal parts to be of heavy weight polished brass, heavily chromium plated, of best quality as regularly furnished by the plumbing fixture manufacturer. Provide stop valve in supply to all fixtures and equipment.
- 12.3. Compliance with Americans Disabilities Act:** All ADA fixtures, faucets, flush valves, clearances, and installation shall comply with requirements of the Americans Disabilities Act.

- 12.4. **Guarantee:** Guarantee in writing to make good without cost any defects in materials and workmanship for one year following the date of acceptance of the project unless specified otherwise. Provide free maintenance and service during the guarantee period.

**Scheduled Items:**

**P – 1 Water Closet:** American Standard New Madera 2234.015, 1.6 GPF vitreous china, siphon jet, elongated bowl with 1-1/2" top spud, fully glazed trapway, china bolt caps, Zurn Z6000AV-WS1 flush valve and Bemis 1655SSCT white open-front seat with self sustaining stainless steel check hinge. Provide chrome plated split-ring wall bracket for supply pipe.

**P – 2 ADA Water Closet:** American Standard Madera #3043.102, 1.6 GPF 17" high vitreous china, siphon jet, fully glazed trapway, elongated bowl with 1-1/2" top spud, china bolt caps, Zurn Z6000-AV-WS1 flush valve and Bemis 1655SSCT white open-front seat with self sustaining stainless steel check hinge. Provide chrome plated split-ring wall bracket for supply pipe. Coordinate flush valve installation with grab bar. Flush valve control/handle shall be mounted for use from the wide side of the toilet stall. Finished floor to top of seat shall be 17" to 19".

**P – 3 ADA Urinal:** American Standard Allbrook 6541.132, 1.0 GPF, vitreous china siphon jet urinal 3/4" top spud, Zurn Z6003-AV-WS1 flush valve with vacuum breaker and Josam Series 17810 carrier. Provide chrome plated split-ring wall bracket for supply pipe. Finished floor to rim shall be set at 17".

**P – 4 Lavatory:** American Standard Lucerne 0355.012, 20" x 18" vitreous china lavatory with Delta 523LF-HDF faucet and drain, McGuire #LF2165 supplies with stops, and McGuire 8872 1-1/4" chromium plated cast brass p-trap with cleanout and chromium plated 17 gauge tubing drain to wall with escutcheon. Supplies shall be lead-free, AB1953 certified by recognized authority and bear manufacturer and testing mark. Provide lead-free mixing valve (ASSE 1070) with tempered water line to faucet. Mixing valve shall be provided with dual check valves and 40-mesh stainless steel screen. Mixing valve shall be Watts Series LFUSG-B-QC-M2 or approved equivalent. Provide heavy-duty floor support equivalent to J.R. Smith 0710 chair carrier with concealed arms. Insulate supplies, trap and drain with premolded, ADA compliant, protectors as Manufactured by Truebro, LavGuard or McGuire Pro-Wrap only.

**P – 5 ADA Lavatory:** American Standard Lucerne 0355.012, 20" x 18" vitreous china lavatory complete with Delta 501LF-HDF faucet, McGuire #LF2167, 1/2" supplies with stops, McGuire #155WC offset drain, McGuire 8872 p-trap and heavy-duty floor supported JR Smith Series 0710 chair carrier with concealed arms. Supplies shall be lead-free, AB1953 certified by recognized authority and bear manufacturer and testing mark. Provide lead-free mixing valve (ASSE 1070) with tempered water line to faucet. Mixing valve shall be provided with dual check valves and 40-mesh stainless steel screen. Mixing valve shall be Watts Series LFUSG-B-QC-M2 or approved equivalent. The entire assembly shall comply with ADA and ANSI standards. Provide heavy-duty floor support equivalent to J.R. Smith 0710 chair carrier with concealed arms. Insulate supplies, trap and drain with premolded, ADA compliant, protectors as Manufactured by Truebro, LavGuard or McGuire Pro-Wrap only. Mounting height to rim shall be 34".

**P – 6 Mop Basin:** Stern Williams MTB-2424 terrazzo mop service basin, size

24" x 24" x 10" drain, with stainless steel dome strainer, T-10-VB with 30" long hose, and bracket, T-40 mop hanger, BP-2-24 20 ga., 12", 304 Stainless Steel Backsplash, A-20-24 stainless steel bumper guard, T-10-VB water faucet with vacuum breaker and 3/4" hose thread spout, adjustable wall brace, pail hook and C-10 silicone sealant at all points where basin meets wall or floor. Equivalents by Floestone or Acorn will be acceptable.

**P – 7      Bi-Level Indoor Electric Water Cooler With Bottle Filler:** Elkay #LZSTLG8WSSK, filtered, bi-level, wall mounted, front and side bubbler push bar, electronic bottle filler sensor on lower unit, ADA and ICC A117.1 compliant with cane apron, stainless steel cabinet and receptor, safety bubbler and 5-year warranty. It shall provide 8 gal/hr of filtered water at 50°F based on 80°F inlet water and 90°F ambient temperature, per ASHRAE 18 testing. Unit shall be certified to UL 399 and CAN/CSA C22.2 No. 120 and NSF/ANSI 61 & 372 for lead free design. Furnish with 1-1/4" rough brass p-trap, 17 gauge brass tailpiece and waste with wheelless stop valve, concealed J.R. Smith 0834 floor mounted support, related 70085-86-6 support plates and base as required for applicable wall construction. Refer to Architectural plans for wall type. Provide three (3) 51300C WaterSentry Plus Replacement Filters, certified to NSF 42, NSF 53 and NSF 372 (Lead free) for each set of water coolers provided. Upon completion of the project, turn over replacement filters to Architect for transfer to Owner. Equivalent units by Halsey Taylor, Oasis or Murdock will be considered.

### **PART 13. ACID NEUTRALIZATION TANK**

- 13.1.      General:** Contractor shall furnish and install high-density polyethylene acid neutralization tank. Tank shall be rotationally molded seamless construction, with steel flanged top, bolt-down cover, required anchors to prevent flotation and all other items required for a proper installation. Tank shall be Enfield Neutrack #T0055 or equivalent by Zurn, Orion or ParkUSA, having 55 gallon capacity, complete with 4" inlet and outlet, and 2" vent connection. Tank shall be installed in accordance with manufacturer's recommendations. Provide heavy-duty manhole (full size) extension to finished grade and concrete surround as shown on the plan details.

Contractor shall furnish and fill the tank prior to operation with approved neutralization agent such as limestone or marble chips, one to three inches in size, to a level just below the tank outlet. Water should be added to the tank after placement of neutralization agent.

Provide required anchors to prevent flotation.

### **PART 14. EMERGENCY LAB GAS SHUTOFF CONTROL PANEL**

- 14.1.      General:** Contractor shall furnish and install recessed, utility control panel and all required accessories for a complete and functional system. Panel shall isolate the utility indicated via a key switch or in case of emergency, by operation of the emergency EPO button. Unit shall include a shrouded emergency knock off button to avoid accidental shutdowns, gas solenoid valve, LED display and key lock for authorization control. Panel shall bear a UL label and comply with UL 61010-1 and NFPA 54 and 3-year parts and labor warranty. Panel shall be American Gas Safety Corporation Model Merlin 500S or equivalent by Isimet or ASCO.

## **PART 15. MISCELLANEOUS EQUIPMENT FURNISHED UNDER OTHER SECTIONS**

- 15.1. General:** Equipment indicated hereunder is to be furnished and set in place under another Section of the Specifications (or is to be so provided under a separate contract). Verify exact size and location of vents, waste and supply connections from approved rough-in drawings and/or catalog data sheets. Allow for modifications required by the shop drawings without additional cost to the Owner or the Owner's Project Design Professionals.

All water and gas connections are to be complete with stop valves.

- 15.2. Science Classroom Fixtures and Sinks:** All science classroom fixtures, sinks, etc. shall be furnished complete with faucets, drains, acid resisting traps, cocks, vacuum breakers, overflow drains and in general all control and operating trim by equipment and fixture supplier (See Science Classroom Equipment Section).

The Plumbing Contractor shall rough-in; provide acid-resisting waste fitting from trap to sewer; provide service stop valves in all water supplies; gas cocks; other accessories, materials, labor and make all connections as required for a complete first class installation ready for operation. The Plumbing Contractor shall also install sinks in casework and assemble required piping, faucets, outlets and trim as outlined in Science Classroom Equipment Section.

Refer to acid resistant piping requirements specified hereinbefore.

**END OF SECTION**

## SECTION 15700

### HEATING, VENTILATING AND AIR CONDITIONING

#### PART 1. GENERAL

- 1.1. **General Provisions:** Section 15010 is applicable in full hereto. **No materials or products that contain asbestos, formaldehyde, lead or mercury, in excess of limits mandated and defined by OSHA, LEED and the EPA, shall be utilized.**

Manufacturers not named in the specifications require prior approval, seven (7) days prior to bid date. Follow procedures set forth in Division 1 of the specifications.

- 1.2. **Qualifications of Subcontractor:** Must be properly licensed and established as a Heating and Air Conditioning Contractor at location of the work and shall maintain locally adequate service facilities. He shall have had previous experience in the satisfactory installation of at least six (6) systems of this type, size and scope.
- 1.3. **Scope:** Include all equipment, material, and labor required for complete and satisfactory operation of HVAC systems, even though not every item involved is indicated. Do not attach any items to other trades' assemblies. Items shall be attached to building structural system. Advisory provisions listed in all Codes referenced in the Contract Documents are mandatory. Where conflicts occur between a Code, Standard, the contract drawings or specifications, the most stringent requirements shall govern and be applied. Refer to other sections of this specification and Section 15010 for additional information and requirements.
- 1.4. **Site Visits / Inspections:** It is the contractor's responsibility to have the job ready for inspections when they are scheduled. If the project is not ready for the requested inspection and the Architect, any governmental agency or any other entity requires a re-inspection, the contractor shall pay Zgouvas, Eiring & Associates a re-inspection fee of \$1,500. The payment shall be made directly to Zgouvas, Eiring & Associates 5 days prior to the scheduled re-inspection.
- The Contractor is cautioned to carefully review the extensive requirements of Paragraph "Identification" in Section 15010 of the specifications and note that **identification is required to be completed before certain inspections. Failure to comply with this provision will be cause for cancellation of the inspection with all costs of the re-inspection to be borne by the Contractor responsible.**
- 1.5. **Miscellaneous:** The Contractor shall carefully examine the contract documents during the bidding phase. Any missing information in the contract documents that is required for obtaining accurate pricing shall be brought to the attention of the Architect, **prior to bid date**, so all may be clarified and/or corrected. Failure to identify and resolve the issues prior to bid shall require the Contractor to provide said items, complete, without additional cost to the Owner or the Owner's Project Design Professionals, using materials and methods specified by, and as directed by, the Owner's Design Professionals.
- 1.6. **Painting and Colors:** Furnish to the Architect, color cards for standard and premium colors available. **The Architect shall select color where choices exist.** Refer to Architectural Painting Section of the specifications for additional requirements.
- 1.7. **Safety Provisions:** Provide covers or guards on all hot, moving and projecting items

that may be deemed by the Engineer, Architect or Owner to be a hazard to occupants of the building or to service personnel.

- 1.8. **Spare Parts:** Manufacturer of any equipment specified shall have a wholesale outlet for readily available replacement parts in the nearest major USA city.
- 1.9. **Submittals:** Refer to Section 15010 for requirements.
- 1.10. **Identification:** Refer to Section 15010 for identification requirements. There are specific requirements prior to the above ceiling and final inspections, respectively, that are mandatory. The identification section of the specification is extensive. The Contractor shall refer to Section 15010, review and provide all identification requirements specified. **Failure to comply with this provision will be cause for cancellation of the inspection with all costs of the re-inspection to be borne by the respective Contractor responsible.**
- 1.11. **Firestopping:** Refer to Section 15010 for requirements. **Note that Division 15 firestopping specifications require firestopping of all penetrations regardless of wall/ceiling/floor construction. Refer to Division 1 for additional requirements.** Where there is a conflict between Division 1 specifications and Division 15 specifications, the most stringent requirements shall govern, be applicable and shall be provided.
- 1.12. **Service, Charges, Grease, Filters, etc.:** Furnish complete first charges of refrigerant, grease, oils, etc., and be responsible for such full charges for the guarantee period. Provide service and maintenance for all equipment and systems during the guarantee period. As a minimum, quarterly service calls and reports are required. Make last service call two weeks prior to year-end inspection. All quarterly service shall include lubrication of all motors, bearings, calibration and adjustment of all controls, full refrigerant charge, new filters, belts, etc. **The Contractor is responsible for quarterly filter changes during the guarantee period and shall inscribe onto the filters' casing the date filters were installed/replaced.** The Contractor shall furnish to the Architect and the Owner individual written service reports for all work done under this warranty. Failure to provide the Architect with the Owner's written acknowledgement of service calls shall be construed to mean that the service calls have not been accomplished and are still required.
- 1.13. **Field Instructions:** The Contractor shall operate all systems for a period of six (6) days after completion of the work. During this time, provide competent personnel to thoroughly instruct representatives of the Owner in the proper operation and care of all equipment and control systems. Secure written acknowledgement of such training from the Owner. Failure to provide the Architect with the Owner's written acknowledgement of this training shall be construed to mean that the instructions have not been accomplished and are still required.
- 1.14. **Bound and Framed Instructions:** Two weeks before final inspection, furnish three complete sets of operating and maintenance instructions, bound in hard cover, indexed and tabbed. The first sheet in the bound instructions shall be a list with each product, name, address and telephone number of:
- a. Subcontractor and installer
  - b. Table of Contents listing all products in the order that they appear in the specifications. Label each tab accordingly. Each item (HP-A, AHU-1, EF-A, etc.), individually, shall be included.
  - c. Provide a summary page that lists each item with its respective warranty listed

- d. Local source of supply for parts and replacement
- e. Provide wiring and control diagrams with explanatory data; control sequence describing start-up, operation and shutdown; operating and maintenance instructions for each piece of equipment; manufacturer's bulletins and catalog data; parts list and recommended spare parts. Fold in large sheets of drawings.
- a. A general maintenance section shall be included. Provide a list indicating all routine maintenance procedures based on the respective manufacturer's recommended intervals. As a minimum, maintenance shall be grouped and individually tabbed to indicate maintenance operations required:
  - 1. Once a month
  - 2. Quarterly
  - 3. Once every six months
  - 4. Once a year
- f. Provide drawings of system control and wiring diagrams, condensed operating instructions, and lubricating schedule and include in binder. All components shall be numbered and identified on diagram. Submit for approval. After approval, place in the binder. Also, frame under glass or plastic and mount in each mechanical room in an optimally viewed location.
- g. Record drawings of the HVAC drawings in hard copy and PDF.
- h. Copy of Test and Balance Report to include testing of fire dampers, etc. as specified.
- i. Copies of all Site Visit/Inspection Reports including Contractor's written response that items listed were corrected.
- j. Provide copy of results of all tests specified.
- k. Provide copy of all start-up reports specified.
- l. Provide Owner's letter certifying training of Owner's personnel in the operations of the HVAC systems has been accomplished.

Additionally, the Contractor shall provide all of the aforementioned information, in digital Adobe Acrobat PDF format, on a CD-R CD. The PDF file shall be provided with an embedded index for each item specified. It shall appear in the left hand window of the opened document so that the Owner or his maintenance personnel can "click" on the indexed item and move immediately to that specific item.

- 1.15. Warranty:** Guarantee work as set forth in Section 15010 and Division 1. Guarantee in writing to make good without cost any defects in materials and workmanship for one year following the date of acceptance of the project unless specified otherwise and 5-year compressor warranty. Provide free maintenance and service during the guarantee period to **include furnishing and replacing of filters**. Refer to other parts for additional requirements and extended warranty requirements.

## **PART 2. ELECTRICAL WORK AND EQUIPMENT**

- 2.1. Power:** All power wiring required for installation of equipment is specified under Electrical Division. Electrical equipment shall be compatible with the current shown on electrical drawings. **Verify voltage and power requirements with Electrical Contractor and Electrical plans prior to ordering equipment.**
- 2.2. Motors:** All motors furnished shall be designed, manufactured, and tested in accordance with the current applicable standards of NEMA, ANSI, IEEE, and ASTM. As a minimum requirement, all motors shall conform to the current applicable sections of NEMA Standard No. MG-1. Motors must meet or exceed The Consortium



for Energy Efficiency (CEE) Premium Efficiency™ full load efficiencies. All motors shall be listed under UL recognized component file as applicable. All motors shall be suitable for installation according to the requirements of NEC. Motors shall be wound for the specified voltage and a 1.5 service factor, 1750-RPM open drip proof construction unless otherwise shown or specified. The bearings shall have a rated fatigue life of B-10 of 150,000 hours for direct-coupled applications and 50,000 hours for belted applications minimum. Belted rating shall be based on radial loads and pulley sizes called out in NEMA MG 1. Load on motors shall not exceed 100% nominal horsepower. Routine factory testing shall be conducted in accordance with Method B of IEEE 112 (current edition), Standard Test Procedure for Polyphase Induction Motors and Generators and shall be as described in Article 12.55 of NEMA MG1, Motors and Generators. **Premium efficient motors shall be warranted for 36 months from date of acceptance of the project.**

Where shown, specified or required, furnish increment wound motors for two-step starting. All motors shall be provided with overload protection and phase protection on all legs. Do not run motors until correct overload elements are installed in starters. Trading overload elements for elements of correct size for motors actually furnished shall be included in this Section. Motors shall be by Allis Chalmers, General Electric Goulds, Louis Allis, Westinghouse or approved equivalent. All motors serving outdoor equipment exposed to weather shall have TEFC motors meeting the requirements set forth previously.

**2.3. Fusing:** Provide factory installed fuses in all equipment requiring fusing for branch circuit protection.

**2.4. Motor Starters:** To be furnished under this Section; installation thereof is specified under Electrical Division, except for those which are specified to be factory assembled. Starters shall be Cutler-Hammer, Allen-Bradley, Square D or General Electric. Starters shall be U.L. and NEMA approved. Where required for interlocks provide built-in step down transformer. Motors for VFD drives shall be designed for NEMA MG-1, Part 30.

Provide for each motor or group of motors requiring a single control (and not controlled from a motor-control center), a suitable controller and devices that will function as specified for the respective motors.

Provide overload protection for each ungrounded conductor to each motor 1/8 HP or larger (manual reset type unless indicated otherwise). The overload-protection device shall be integral with the motor or controller. Unless indicated otherwise, furnish pilot lights with all remote starters. Where auxiliary control devices are connected into control circuit, these devices shall not bypass safety controls (motor-overload protective devices, high-pressure cutouts, low pressure cutouts, etc.). Provide "Hand - Off - Auto" switches, auxiliary contacts, etc. for all starters.

**2.5. Phase Protection:** All fan motors, indoor units, outdoor units, condensing units, packaged units, etc., shall be provided with surge protection and phase protection to insure against voltage unbalance, over/under voltage, phase loss, reversal, incorrect sequencing and rapid short cycling. Protection shall be provided for all 3-phase equipment utilizing ICM Controls Model 450 or equivalent. All single phase equipment with horsepower greater than or equal to 1/8 HP shall be provided with protection utilizing ICM Controls Model ICM 492 or equivalent. The Contractor shall consult with the Owner's maintenance personnel and set up all programmable options based on the Owner's requirements, within the device's capabilities. Phase protection is not required on equipment being controlled via a variable speed

frequency drive; if the specified protection is inherent with the variable speed drive furnished.

- 2.6. **Controls:** HAC Contractor shall be responsible for the furnishing and installation of all controls, and control and interlock wiring, as specified or required to properly complete the installation. Control conduit is specified in Electrical Division of the specifications and/or shown on electrical drawings. Minimum control conduit size shall be 3/4". All control conduit, power wiring, relays, contactors, etc. for controls, which are not shown on the electrical drawings or specified in the Electrical Division of the specifications, shall be provided under this HVAC Section. Coordinate all requirements with the Electrical Sub-Contractor prior to bid. All thermostat and humidistat boxes shall be mounted 46" A.F.F. to the center of the box (ADA height). Where wall mounted CO2 Sensors are indicated, they shall be mounted 58" A.F.F. to the center of the box. Electrical work performed under this Section shall conform to requirements set forth in the Electrical Division of the specifications. All wall mounted devices shall be provided with hinged, locking metal covers with rounded edges. All work shall be done by an approved, independent HVAC Controls Subcontractor whose primary business is the installation and servicing of HVAC controls systems.
- 2.7. **Controls and Instrumentation Cable:** Instrumentation cable shall be minimum AWG as recommended by the equipment Manufacturer or the HVAC controls system Manufacturer. The most stringent shall be provided. In absence of those requirements, cable shall be stranded copper, single or multiple twisted, minimum 2 inch lay of twist, 100 percent shielded pairs and shall have 300-volt insulation and as required by the NEC, Current Edition. Each pair shall have a tinned copper drain wire and individual overall pair insulation. Cables shall have an overall aluminum polyester or tinned copper cable shield tape. All wiring, cabling, conduit, connections, etc., shall be plenum rated and rated for use at temperatures and conditions expected in the location of mounting
- All wiring and cable shall be in metallic conduit except conduit is not required above lift-out (lay-in) ceilings. Minimum conduit size shall be 3/4". Provide independent, minimum 2" wide, aluminum or rust resistant coated steel J-hook supports for all wiring not in conduit. Wiring supports shall be attached to the building structural system (not other trades' supports, piping, duct, ceiling suspension system, etc). Wiring, cabling, etc., shall be neatly bundled together and supported at no more than four (4) feet on center.
- 2.8. **Wiring Diagrams:** Furnish to the Electrical Contractor for the specific makes and models of electric-motor operated equipment to be installed. **Verify voltage and power requirements with Electrical Contractor and Electrical plans prior to ordering equipment.**
- 2.9. **Modifications:** The cost of any modifications of the electrical power wiring and/or control wiring conduit required by heating, air conditioning or ventilation equipment or controls having electrical power requirements differing from that shown on the electrical drawings and/or as specified, shall be the responsibility of the Mechanical Contractor. **Verify voltage and power requirements with Electrical Contractor and Electrical plans prior to ordering equipment.**

### **PART 3. PLUMBING WORK**

- 3.1. **Floor Drains:** By Plumbing Contractor. HAC Contractor shall provide drains from all air conditioning equipment drains, etc. to the floor drains or to outside as indicated on the plans or, in absence of the previous requirements, as directed by the Architect.

### **PART 4. VIBRATION AND NOISE CONTROL**

- 4.1. **General:** Elimination of objectionable vibration and noise is the responsibility of the Contractor, who must provide all foundations, isolators, flexible connections, air chambers, curbs, etc. required thereby. Pay special attention to vibration problems at year end inspection and correct all deficiencies noted.

All items of mechanical equipment including air handling equipment, condensing units, pumps, piping, indoor cassette units and fans shall be properly isolated from the structure by means of the Engineer's approved vibration absorbing accessories, foundations or supports. Each foundation shall include an adequate number of standard isolation units. Install floor mounted pumps and air handling units on minimum of 6" thickness, 6,000-psi concrete pads, inertia bases or base rails as shown on the plans or as specified. Final concrete requirements shall be as directed by the Structural Engineer. Foundations for each piece of equipment shall be submitted for approval.

Manufacturer shall be TR Finn and Co., Inc. or equal product by Amber-Booth, Consolidated Kinetics, Korfund Dynamics, Mason Industries or Vibro-Acoustics.

- 4.2. **Vibration Isolation Pads - Indoor Heat Pump Units:** One layer of 3/4" thick continuous neoprene pad consisting of square modules.
- 4.3. **Sound Levels:** Sound levels caused by operation of pumps, fans, air handling systems, etc., whether generated within rooms or transmitted to rooms through ducts, walls or floors, pipes, etc., shall not exceed specified NC rating at any point within room not more than 6 feet from an air outlet in accordance with ASHRAE octave band method. Offices, classrooms, conference rooms and similar spaces shall have maximum NC-32; corridors, and lobbies, NC-40; toilets, NC-45.

### **PART 5. TESTING, START-UP, BALANCING, ETC.**

- 5.1. **General:** Conduct tests upon completion of the heating, ventilation and air conditioning installations, and at times as designated by the Architect. Furnish written reports to the Architect of all tests results. Provide copies of all test results in the Bound and Framed Instructions specified hereinbefore. Furnish all necessary personnel, test instruments, power, fuel, etc., as required to complete the specified requirements.
- 5.2. **Refrigerant Piping:** Test with CO<sub>2</sub> gas and prove tight. Test high and low side of system at 500 psi. After evacuating the system and charging with refrigerant, test piping with a halide torch and prove tight under actual operating conditions.
- 5.3. **Ductwork for Systems Less Than 2,000 CFM:** Test all supply, return and exhaust ducts, plenums and casings and make substantially airtight before covering with external insulation or concealing masonry. Substantially airtight shall be construed to mean that no air leakage is noticeable to the senses of touch or sound at joints.

- 5.4. **Performance Tests:** After cleaning, balancing, and testing are completed as specified, test each system as a whole to see that all items perform as integral parts of the system and that temperatures and conditions are evenly controlled throughout the building. Make corrections and adjustments as necessary to produce the indicated conditions. All work shall be performed by an independent test and balancing agency whose primary business is the testing and balancing of heating and air conditioning systems and its related components. The test and balancing contractor shall hold a current NEBB, NBC or AABC certification. **Balancing agencies shall submit experience record and references to Engineer for approval a minimum of seven (7) days before bid date.** The test shall cover a period of not less than three days and shall demonstrate that the entire system is functioning properly. As a minimum provide the following:

Date of testing, space temperature and humidity, outdoor air temperature (DB & WB), air temperature entering condenser coil; refrigerant suction temperature and pressure at compressor evaporator coil; condensing temperature and pressure and load amperes for all motors. Also, provide CFM readings at all grilles, registers and diffusers and entering and leaving air temperatures at each evaporator coil.

After building is occupied, make adjustments as requested by Owner.

- 5.5. **Balancing:** Check airflow at all supply, return and exhaust grilles, all diffusers and outside air intakes with a recently calibrated direct-reading velocity instrument. Adjust systems to deliver, supply air, return air or exhaust air quantities to within 5 percent of the indicated amounts. Provide instruments and otherwise assist Architect in checking balancing at final inspection.
- 5.6. **Phase Protection Verification:** The Test and Balance Contractor, with cooperation from the Mechanical Contractor, shall verify that all phase protection specified has been installed where specified, and installed per the Manufacturer's requirements. The verification of this requirement shall be furnished in tabular form with findings included in the test and balance report. The summary shall list all equipment specified to have the protection, verification that the device is installed per the Manufacturer's recommendation and has been programmed to the Owner's requirements.
- 5.7. **Test Data:** Submit typewritten schedules of readings taken during the testing and balancing operations and a line diagram or plan of the system indicating specified quantities and final balanced quantities **two weeks prior to final inspection. No final inspection will be made without this data.** Report the required or specified reading, the first reading taken, and final balanced reading for the following items:

**Fans:** Size, type, speed rpm, outlet velocity in fpm, static pressure inches water, air quantity in cfm, and motor load in amperes.

**Air Handling Equipment:** Size, type, fan speed in rpm, outlet velocity in fpm, external static pressure inches water, total static pressure inches water, air quantity cfm, and motor load in amperes.

**All Air Outlets and Inlets:** Size, velocity in fpm, and air quantity in cfm.

**Coils:** CFM, size, face velocity in fpm; air temperature entering coil and air temperature leaving coil, wet-bulb and dry-bulb degrees F.

**Refrigerant Hot Gas Reheat Coil:** Adjust humidistat so that valve opens. Verify modulation of the coil valve. Provide coil size, face velocity in fpm; air temperature entering coil and air temperature leaving coil, wet-bulb and dry-bulb degrees F.

**Ducts:** Size, velocity in fpm, and air quantity in cfm.

**Air Cooled Condensing Units:** Air temperature entering condenser coil; refrigerant suction temperature and pressure at compressor and evaporator coil; condensing temperature and pressure and load amperes for all motors.

- 5.8. **Control Settings:** Provide typed list indicating job setting of all automatic controls. Include settings of thermostats, humidity controls, CO2 sensors, safety controls, minimum damper settings, fire-safety thermostats, pressure controls, temperature controls, and other similar items. Tabulate to show type of control, location, setting and function. Verify that all safety settings and limits are appropriate and comply with current safety Codes and Regulations for the respective system.
- 5.9. **Notification:** Notify the Architect one week prior to all testing. The Contractor shall provide all testing equipment and shall furnish written reports to Architect of all tests results. Additionally, provide copies in the Bound and Framed Instructions specified hereinbefore.

## **PART 6. SHEET METAL DUCT WORK (LOW VELOCITY 2" S.P.)**

- 6.1. **Scope:** Provide as shown and as required for the air conditioning, heating and ventilation systems. Make changes in dimensions, offsets or crossovers as necessary to clear piping, lights and structural members, and to maintain scheduled headroom. Provide all accessories required. Refer to architectural drawings and specifications. Refer to Architectural section "Painting" for painting of exposed ductwork. In case of the absence of painting requirements in the aforementioned Specification Section(s), the interior and exterior of ductwork visible from any finished space shall be cleaned, primed and painted as directed by the Architect. Ductwork visible through all grilles, registers, diffusers, ceilings, etc. shall be painted flat black with paint having a fire hazard rating not to exceed 25 for flame spread and 50 for fuel contributed and smoke developed as determined by ASTM E84. **Metal manufacturer's duct material stamp shall be visible on duct exterior surfaces. Any ductwork without the manufacturer's material stamp indicating sheet metal gauge thickness, material, etc., shall be cause for immediate rejection of the effected installation**
- 6.2. **Protection of Interior of Duct from Debris:** ALL open portions of ductwork shall be covered with a self-adhesive film or airtight sheet metal caps to prevent the intrusion of contaminates. All duct taps, duct take-offs, etc., shall be protected immediately after the tap, take-off, etc. has been fabricated in the field. When sections of sheet metal are delivered to the facility for fabrication in the field, which cannot be protected with the specified material, the sheet metal shall be covered with visqueen. Prior to erecting same, ductwork shall be manually cleaned to remove all dust, dirt and construction debris. All ductwork shall be erected clean. After each section of ductwork is erected, immediately protect all openings as specified herein before. In effect, there shall be no ductwork opening that is exposed to the ambient air. The material shall be a minimum of 3-mil thickness and have a minimum tensile strength of 10 psi. It shall be UV resistant, waterproof and recyclable. Material shall be DuroDyne Dyn-O-Wrap or approved equivalent. **Any ductwork discovered to be unprotected as specified is subject to immediate rejection for use on this project.**

- 6.3. **Protection of Interior of Ductwork When Any Air Moving Equipment is Operating During Construction and Prior to Owner's Occupancy:** If air moving equipment must be used during construction, temporary filtration media with a Minimum Efficiency Reporting Value (MERV) of 8, as determined by ASHRAE 52.2 and shall be installed at each return air grille, return air register, exhaust grille, exhaust register, and unit return air inlet. The General Contractor shall provide a written request to the Architect for permission to temporarily operate any HVAC equipment during construction. The request shall be provided a minimum of seven (7) days prior to the desired date of the interruption. Do not operate any equipment without the Architect's written approval.
- 6.4. **Sizes:** Take measurements at job and fit work into available space. Report to the Architect any unworkable conditions encountered and alter layout or duct sizes as directed without additional cost to the Owner or the Owner's Project Design Professionals. Unless otherwise approved, conform to dimensions indicated. Duct dimensions shown indicate NET FREE AREA after installation of duct liner; increase sizes indicated to allow therefore.
- 6.5. **Sheet Metal:** ARMCO, or equal, prime quality, G-90 galvanized sheet steel. Unless indicated otherwise on the plans, gauges shall be as recommended in the current edition of current SMACNA "Duct Construction Standards" **but in no case shall be less than listed in the table below for the respective duct largest dimension or diameter.**

Up to 30 inches	24 ga.
31 to 54 inches	22 ga.
55 to 84 inches	20 ga.
85 to 96 inches	18 ga.

Where galvanized metal joins aluminum or copper, separate sheets with lead or chromate impregnated felt gaskets.

- 6.6. **General Fabrication:** Construct and erect in a skillful manner, meeting requirement of the current SMACNA "Duct Construction Standards" for 2" static pressure unless noted or specified otherwise. **Where conflicts occur between current SMACNA and the contract drawings or specifications, the most stringent requirements shall apply and the heaviest gauge metal shall be provided.** Form straight and smooth on the inside, with joints neatly finished. Make up in sections of such length that mechanic can reach thru open end to seal insulation at previous joint. Assemble and anchor to be completely free from vibration and drumming under all conditions of operation. Make takeoffs at round ducts with prefabricated round-to-rectangular and rectangular-to-round transitions. Break so that manufacturer's quality stamp is exposed to view.

Where ductwork penetrates rated or non-rated partitions above the ceiling or insulation support/attic air barriers, openings shall be sized as required for duct and insulation, plus 1". Openings shall be saw cut or properly blocked out and present a neat appearance. Where penetration occurs at rated assemblies, provide appropriate fire damper and install as specified and detailed. Where penetration occurs at non-rated assemblies, fill void between assembly and duct with fire retardant mineral wool insulation and seal with fire stopping material to prevent the passage of smoke and fire. After closing and filling the annular space, provide 4" wide, 16 gauge galvanized steel closure plates around the penetration, completely covering the opening.

Closure plates shall fit snugly to duct, shall be secured to assembly and sealed air tight.

Provide additional supports to raise ductwork off any metallic piping. Wherever any bare metallic piping is in contact with externally insulated duct or bare sheet metal duct, there shall be dielectric separation provided. The Contractor shall provide 1" thickness, unslit AP Armaflex insulation of sufficient inside tubular diameter to snugly and completely cover the respective piping. The insulation shall extend the full length of the affected area plus 6" on both sides. Refer to Part "Pipe and Miscellaneous Insulation Work" in this division for AP Armaflex material specification. The use of Rubatex insulation between piping and the ductwork shall only be allowed when providing supports is not an option.

- 6.7. Exposed Ductwork:** Install tight against the wall and/or ceiling with drive slip joints. Provide 4" wide, 16 gauge galvanized steel closure plates, except at grilles and registers, where exposed ducts pass through walls and partitions. Fill void between wall penetration and duct with fire retardant mineral wool insulation and seal with fire stopping prior to installing closure plate. Closure plates shall fit snugly to duct and shall be secured to wall. All ductwork and closure plates that are exposed to view in finished areas shall be primed and painted as directed by the Architect.

All exposed rectangular ductwork traverse joints shall be made with all metal Ductmate joints system as manufactured by Ductmate Industries, Inc., Quikduc Transverse Duct Connection Systems, Duro Dyne Dyn-O-Mate or approved equivalent. Ductmate system shall be installed in strict accordance with current SMACNA and manufacturer's recommendations and instructions.

Refer to Architectural section "Painting" for painting of exposed ductwork. In the absence of painting requirements in the aforementioned Specification Section(s), the exterior of ductwork visible from any finished space shall be cleaned, primed and painted as directed by the Architect. Ductwork visible through all grilles, registers, diffusers, ceilings, etc. shall be painted flat black with paint having a fire hazard rating not to exceed 25 for flame spread and 50 for fuel contributed and smoke developed as determined by ASTM E84.

- 6.8. Branch Ducts to Diffusers:** Round runouts to diffusers, up to and including 14" round, shall be 24 ga., G-60 galvanized, Ductmate Series GreenSeam +Snap Lock pipe with factory sealed longitudinal and transverse gaskets. Gasket for GreenSeam +Snap Lock pipe shall contain antioxidants, fungicides, adhesion promoters, zero VOCs and shall meet or exceed ASTM E-84 test requirements. 16" round to 20" round runouts shall be 24 ga. and equal to Ductmate Series Reeves Lock Pipe, G-60 galvanized pipe.
- 6.9. Return Air Platforms:** Return air platforms shall be constructed with 1-1/2"x1-1/2"x1/4" steel angle iron frame and 18 ga. G-90 galvanized steel. Insulate all sides, top and bottoms with 2" thickness, 1.5 lb. density duct liner. Provide angle iron supplemental supports and pedestal type pipe columns to support the units and allow individuals to stand on the platform without platform deformation or failure. Platforms shall be a minimum of 24" tall, or as space permits.
- 6.10. Cross-Joints, Seams and Stiffening:** Join and stiffen with combination of joint types and structural angles as recommended in current SMACNA "Duct Construction Standards". **Cross break all flat areas over 18 inches wide.** Install internal ends of slip joints in the direction of flow. Non-galvanized pieces must be painted before assembling with Rust-Oleum metal primer. All transverse joints with long dimension

over 24" shall be made with all metal Ductmate joints system as manufactured by Ductmate Industries, Inc., Quikduc Transverse Duct Connection Systems or Dyn-O-Mate. System used shall be installed in strict accordance with current SMACNA and manufacturer's recommendations and instructions.

Make all cross joints and all branch, grille and diffuser take-offs, except Ductmate joints, air tight by applying fibrated, low VOC, LEED IEQ 4.1 compliant duct sealer. Sealer shall meet and pass ASTM D-2202, ASTM C-731 and EPA regulations. Sealer shall meet the requirements for the pressure classification of the ductwork installed. Sealer shall be Hardcast Duct Seal 321, Foster 32-17 or Childers CP-148.

- 6.11. Turns and Transitions:** Fabricate turns with an inside radius equal to width of duct. At 90-degree turns, Contractor may substitute square elbows, with standard factory-made, multiple, double-blade constructed vanes. Vanes shall be a double wall, true airfoil contour with smoothly rounded entry nose with extended trailing edge. Vanes shall be formed from a single piece of 26 ga., hot dipped galvanized steel and shall be 3" radiused vanes on 2.4" centers. Vanes shall be provided with two (2) tie rods and continuous internal tubes for stiffening and rigidity. Maximum pressure drop shall be .06" W.G. at 1500 FPM. Generated sound power level shall not exceed 54 decibels in band 4 at 2000 FPM (24"x24" duct size). Vanes shall be as manufactured by Aero/Dyne Series HEP, Duro Dyne HTV/DHV or approved equivalent by DuctMate. Avoid abrupt changes in shape, with a slope of 4:1 the minimum allowed.
- 6.12. Branch Duct Take-Off:** Provide at all points where branch ducts take off from trunks, and where ducts divide. Refer to details on the drawings. Damper shall be minimum 22 Ga., G-90 Galvanized steel with 2" build out. Body shall be a minimum of 24 Ga., G-90, galvanized steel with 4"W.G. construction. Fitting shall have 1" flange with corner clips, pre-punched mounting holes and adhesive coated gasket. Take-off shall be Flexmaster LDS, BO3, GSI HETO (high efficiency take-off) HTS2 or approved equivalent.
- 6.13. Volume Dampers Used with Automatic Controls:** See Controls at end of Section 15700.
- 6.14. Volume Dampers:** For round ducts less than 12" diameter and rectangular ducts less than 12" in height in either dimension: Single leaf, constructed with 18 gauge galvanized metal with locking type control quadrant, single center u-bolt and pivot rod extending through opposite side of duct with brass bushing at both ends.
- 6.15. Volume Dampers:** For round ducts greater than or equal to 12" diameter or rectangular ducts greater than or equal to 12" height in either direction, provide opposed blade, airfoil blades of 16 ga.-galvanized steel mounted in steel frames by 3/8" steel trunions riding in brass bushing with dual u-bolts. Blade width shall not exceed 10 inches and individual blade length shall not exceed 48 inches. Extend one trunion to permit operation from outside the duct. Provide manually operated dampers with cadmium plated steel locking quadrant. Dampers opening to the outside shall have felted edges.
- 6.16. Stand-Off Mounting Brackets:** Locking-type quadrant operators for dampers, when installed on ducts to be externally insulated, shall be provided with stand off mounting brackets, bases or adapters to provide clearance between the duct surface and the operator not less than the thickness of the insulation. Stand off mounting items shall be integral with the operator or standard accessory of the damper manufacturer.



- 6.17. Access Doors:** Provide in duct wall at each splitter, fire and motorized damper, at each of coil and strip heaters, smoke detectors, in plenums and elsewhere indicated or required for proper maintenance. Size and position to provide maximum access to bearings, fusible links, etc. Typical doors shall be double metal faced, internally insulated same as duct, provided with gasket seal, and with minimum of two-sash locks equivalent to Ruskin Model ADC12 for rectangular ductwork. Access doors for round ductwork shall be similar except with two large hand knobs and equivalent to Ruskin Model ADR1 for round ducts 10" round, up to and including, 16" round duct. Doors shall be rated for the anticipated duct pressure, plus 1". For ducts, 8" round and smaller, provide a removable section of duct to provide required access. Refer to other sections for access doors required in kitchen hood exhaust ducts, moisture-laden ductwork, etc.
- 6.18. Duct Instrument Test Holes:** Provide for each system four test holes (two in supply duct and two in return air plenum) at opposite ends near air handling units with screwed caps. In addition, at duct mounted coils and electric duct heaters provide one on either side of the coil or duct heater.
- 6.19. Flexible Connections:** Install so that the cloth is in folds (not drawn tight). Connect all ducts to air handling units and fans excepting dome type fans with preassembled flexible connection. Install so that the connector is in folds (not drawn tight). Fabric width shall be 6" for all air handling equipment. Ceiling mounted exhaust fans whose total scheduled CFM is less than or equal to 1,200 CFM may be 4" width.

Connectors for all air handling equipment shall be a factory fabricated and assembled unit with 6" dual fabric, heavy duty, 20 oz/sq. yd polyester/polyester fabric with flame resistant coating and mildew resistant per ASTM G-21. The assembly shall comply with NFPA 701, NFPA 90A, NFPA 90B and ASTM E-84. The unit shall be constructed of minimum 24 ga. galvanized steel meeting ASTM A-653-94-G60. Metal to fabric connectors shall be double locked, airtight and waterproof to 10" W.C. positive pressure and 10" W.C. negative pressure. Assembly shall be DuctMate PROflex or equivalent.

Flexible connections for ceiling exhaust fans of capacity specified above shall be preassembled flexible connection of 29 ounce fire-resistant, neoprene coated glass fiber cloth equal to Ventfabrics "Ventglas" (4" fabric width), as manufactured by Ventfabrics, Wiremold or Thermaflex.

Provide preassembled flexible connections for all ducts that cross building expansion joints. Flexible connections shall be 6" in width as specified hereinbefore. Coordinate requirement with Architectural plans and provide as required.

Externally insulate all flexible connectors to prevent condensation.

Provide copper jumpers across all flexible connectors taking care that jumpers do not bind flexible connections. Provide compression lug and grounding connector screwed into the duct with two (2) screws, on both side of the flexible connector. Bonding wire shall be shielded 4 AWG.

- 6.20. Register and Grille Connections:** Where take-offs are in side of a duct, clinch lock short tee sections onto trunk. Install collars with slip joints and 3/4" flange at outlet end. At sheetrock and other hard surfaces, set collars exactly flush with surface (mechanic must be on job to make adjustments during installation). Set flange face to receive register gasket, and be concealed by register flange. Collars may be deleted where mounting frames are furnished with registers.

Install boots above lay-in ceilings simultaneously with ceiling work; mechanic must be on job during this phase of construction work.

At return air, relief air and exhaust air grilles 48" or more in either dimension, collars shall be 1" x 2" x 1/8 inch steel angle frames with corners mitered, welded and ground smooth. Frames in ceiling shall be independently suspended from the ceiling structure, or the duct shall have special reinforcing to prevent sagging of the boot. Interior of ductwork visible through grilles and diffusers shall be painted flat black with paint having a fire hazard rating not to exceed 25 for flame spread and 50 for fuel contributed and smoke developed as determined by ASTM E84.

- 6.21. Hangers and Supports: No duct hangers shall penetrate the external insulation vapor barrier. Where ducts are required to have external insulation with a vapor sealed facing, support duct on trapeze hangers** All duct hanger materials shall be external of the insulation materials, insulation jacket and vapor barriers. All vapor barriers shall be continuous.

**"Sammy" bolts are prohibited.** Contractor shall provide supplemental steel between structural purloins, bar joists, etc., for duct support as required to meet support spacing specified. Supplemental steel shall be welded in place as directed by the Structural Engineer. Support small (less than 40 united (w+h) inches) horizontal ducts without external insulation with 1-1/4" x 20 ga. band hangers. Provide in pairs close to each transverse joint and in no case more than six feet apart. Bands shall be turned 3" under the lower corner of ductwork and fastened with two (2) self-tapping screws into the bottom of the duct surface. Bands shall be attached up the sides of the ductwork at a maximum of 6" intervals and in the bottom of the duct.

Wherever any duct hanger support exceed 36" length from the top of the supported duct to the structure above, Contractor shall provide a uni-strut support assembly and provide bracing of the assembly with minimum 1"x1"x1/4" angle iron, or as required for the weight of the particular duct. Weld angle iron to the unistrut and attach to the overhead structure, as required by the structural engineer, to prevent swaying

All 14" or less concealed round ducts with external insulation shall be provided with band hangers and saddles. Suspend ducts, at six (6) foot intervals with 8" long, 3" wide, 22 gauge galvanized metal saddles hung from structure with 22 gauge 1" wide straps. Bands shall pass completely under and around round ducts. Loop strap under duct and attach to strap with two (2) galvanized bolts. Thereafter, loop top end of hanger over steel structural members above and fasten with two (2) galvanized bolts. Where concrete joists occur overhead, secure straps to side of joist with galvanized expansion or ramset bolts. Where flat concrete surface occurs overhead, secure with ramset or expansion bolt fasteners. See other Specification Sections in the Contract Documents for limitations on use of power driven fasteners.

**Where concealed rigid round metal ducts greater than or equal to 16", any size rectangular or flat oval ducts are required to have external insulation with a vapor sealed facing, support duct on trapeze hangers** with structural supporting angle, 3/8 inch threaded rods and inserts or clamps as required to accommodate overhead construction. Spacing shall not exceed 6 feet. The Contractor shall provide 1 1/2" thickness, unslit AP Armaflex insulation of sufficient inside tubular diameter to slide over, completely cover and snugly fit to the bottom horizontal unistrut duct support. The insulation shall extend the full width of the duct plus a minimum of 6", each side. Where channel shapes are used, orient the open side, down. Refer to Part Pipe and Miscellaneous Insulation Work for AP Armaflex material specification.

Space hangers a minimum of 6" (maximum of 12") from the sides of the duct to permit the duct to be placed within the trapeze hangers.

All concealed internally insulated round ducts shall be supported as specified above for externally insulated ductwork except without saddle. Coordinate exposed duct support requirements with plan details.

Support all non-externally insulated horizontal ducts larger than or equal to 50 united (w + h) inches on trapeze type hangers, with structural supporting angle, 3/8 inch threaded rods and inserts or clamps as required to accommodate overhead construction. Spacing shall not exceed 6 feet.

Support small vertical runs with 1/8" steel bands screwed to 3 sides of duct and expansion bolted to adjacent structural elements; spacing shall not exceed 10 feet.

- 6.22. Roof Intake Hoods:** Greenheck Model FGI/FGR or approved equivalent by Loren-Cook, aluminum or galvanized steel construction unit with welded joints, complete with 1/2" aluminum bird screen, rain gutter, weather baffle, 10" high (exhaust/relief) or 14" high (intake) height NRCA approved roof curb (outside air) with built-in cant strip, integral fiberglass insulation and wood nailer. Hood sizes smaller than 24"x24" shall be hinged type. All intakes, relief or exhaust vents greater than or equal to 12x12 shall be 125 MPH rated. Coordinate with architectural and structural plans for required slope. Coordinate roof curb and interface in the building roofing system. Verify minimum net height to be as required by Code and Architect. Maximum intake throat velocity of 250/500 FPM and .05" WC maximum pressure drop. Maximum relief throat velocity of 600 FPM and .05" WC maximum pressure drop. Hood, throat and curb cap shall be minimum 18ga. All items furnished shall adhere to roofing manufacturer's requirements so as not to void the roofing warranty. Hoods shall be factory primed for painting in the field or factory baked enamel finish. Coordinate finish requirement with Architect prior to ordering.
- 6.23. Roof Exhaust Caps:** For exhaust ducts up to 10x10, shall be low profile, sloped, galvanized steel construction with built-in bird screen, integral flashing flange and all accessories required for a complete installation. Cap shall be Greenheck Series RJ, Cook Series RJ or PennBarry SL as required for sloped shingle roofs. Provide similar device for standing seam metal roofs as required by the roofing manufacturer. All items furnished shall adhere to roofing manufacturer's requirements so as not to void the roofing warranty. Hoods shall be factory primed for painting in the field or factory baked enamel finish. Coordinate finish and color requirement with Architect prior to ordering.
- 6.24. Coil and Strip Heater Enclosures:** Unless otherwise detailed on drawings shall be in accordance with current SMACNA "Duct Construction Standards".
- 6.25. Flexible Air Ducts:** Flexible duct for connections shall be Thermaflex M-KE, GreenGuard Level 4 certified, or approved equivalent, air duct rated for a maximum pressure of 16" (4-10 in. ID) or 10" (12-16 in. ID) water column positive and 2" water column maximum negative pressure and 5000 FPM maximum velocity and Listed by Underwriters Laboratories, Inc., under UL Standard 181 as a Class 1 air duct and complying with NFPA Standards 90A and 90B. Duct shall have a maximum flame spread of 25 and a maximum smoke developed rating of 50. Flexible air duct shall be factory made and composed of an inner duct of woven and coated fiberglass providing an air seal and permanently bonded to coated steel wire helix, a fiberglass insulating blanket and low permeability outer vapor barrier of fiberglass reinforced metallized film laminate. R-value shall be a minimum R=8 per ASTM C-518.

Flexible duct length shall not exceed six (6) feet. Supply each duct with **stainless steel worm gear driver and stainless steel band** at take-off fitting and supply fixture connections. Suspend ducts, at three (3) foot intervals with 8" long, 3" wide, 22 gauge galvanized metal saddles hung from structure with 22 gauge 1" wide straps. Loop strap under duct and attach to strap with two (2) galvanized bolts. Thereafter, loop top end of hanger over steel structural members above and fasten with two (2) galvanized bolts. Branch duct connectors for connecting round low velocity branches to rectangular low velocity trunks shall be rectangular to round take-off fittings as detailed on the drawings with damper and standoff mounting bracket. Provide additional supports to raise ductwork off any piping or as a minimum, provide Rubatex insulation between ductwork and piping. The use of Rubatex insulation between piping and the ductwork shall only be allowed when providing supports is not an option. **Provide a full size radiused, galvanized sheet metal elbow transition piece from flexible duct connection to each diffuser boot.** Elbow gauge shall be as specified hereinbefore in Part, "Sheet Metal Ductwork" for respective duct size.

## **PART 7. DUCT INSULATION WORK (EXTERNAL)**

- 7.1. **General:** All work by Insulating Sub-Contractor whose primary business is the installation of insulation materials with experienced applicators in accordance with manufacturer's recommendations. Duct must be clean, dry and pressure tested before covering is applied. Cover flexible connections with insulation material as hereinafter specified to same thickness as adjacent duct. All insulation materials (coatings and mastics) shall be fire resistive per NFPA Pamphlet No. 90, ASTM C 411, shall be UL listed and shall have a fire hazard rating not to exceed 25 for flame spread and 50 for fuel contributed and smoke developed as determined by ASTM E84, NFPA No. 255 or UL 723. Finished insulation system shall provide complete thermal barrier throughout the equipment and air distribution system, including effective and durable vapor barriers and vapor stops for any system or condition potentially subject to condensation. Insulation system shall be provided to prevent condensation or potential thereof, to prevent transmission of water vapor into the insulation system (vapor barriers), and to prevent transmission of water vapor within the insulation system should vapor barrier compromises occur during operation and/or maintenance of the building (vapor stops).

Refer to Section Sheet Metal Ductwork, Paragraph Hangers and Supports, for miscellaneous insulating requirements.

- 7.2. **Material:** Provide GreenGuard certified glass fiber duct insulation with reinforced foilkraft laminate jacket, formaldehyde-free.

All **supply air** ducts located in the attic, mechanical mezzanine or outside the building insulation envelope shall be provided with a total of 3.5" thickness external insulation, in addition to the specified acoustical liner. The first layer shall be **1.5" thickness, 0.75 lb. density, without reinforced foilkraft laminate jacket** and with characteristics specified above. The second layer shall be **2" thickness, 1.5 lb. density, with reinforced foilkraft laminate jacket** and with characteristics specified above.

All **return air** ducts located in the attic, mechanical mezzanine or outside the building insulation envelope shall be provided with a total of 3.5" thickness insulation, in addition to the specified internal insulation. The first layer shall be internal insulation

as specified below. The second layer shall be **2" thickness, 1.5 lb. density, with reinforced foil kraft laminate jacket** and with characteristics specified above.

All **supply air** ductwork located within the building insulation envelope shall be provided with **2" thickness, 1.5 lb. density, with reinforced foil kraft laminate jacket** as specified above. Note that this requirement does not apply to ductwork that is exposed to view in finished areas. Refer to internal duct insulation requirements for duct exposed to view in finished areas.

Thermal conductivity per ASTM C-518, at its rated thickness, and **0.75 lb. density** shall be not less than  $k=0.27 \text{ BTU}\cdot\text{in}/(\text{hr}\cdot\text{ft}^2\cdot^\circ\text{F})$  and minimum installed  $R=4.2$  at 75°F mean temperature with test based on material thickness compressed 25%.

Thermal conductivity per ASTM C-518, at its rated thickness, and **1.5 lb. density** shall be not less than  $k=0.24 \text{ BTU}\cdot\text{in}/(\text{hr}\cdot\text{ft}^2\cdot^\circ\text{F})$  and minimum installed  $R=6.3$  at 75°F mean temperature with test based on material thickness compressed 25%.

See "Duct Insulation (Internal)" for internal acoustical insulation required in addition to the external insulation specified hereinbefore.

Supply air and return air ducts within the mechanical rooms do not require flexible, external, duct insulation. Instead, supply and return air ducts in all mechanical rooms shall be insulated with 2" thickness, 3.0 lb. density, rigid glass fiber duct insulation to a point above the ceiling of the adjacent conditioned space. Facing shall be aluminum foil reinforced with fiberglass yarn and laminated with fire resistant adhesive to Kraft paper. Thermal conductivity value shall be per ASTM C-612, Type 1B, at its specified thickness, shall be not less than  $k=0.24 \text{ BTU}\cdot\text{in}/(\text{hr}\cdot\text{ft}^2\cdot^\circ\text{F})$  at 75°F mean temperature. Insulation shall meet or exceed the requirements of ASTM E 84, UL 723, ASTM C 1136-Type II, NFPA 90A, NFPA 90B, FHC 25/50 and ASTM C 795. Moisture sorption shall be less than 5% by weight and maximum moisture vapor transmission of 0.02 perms. Insulation shall be Owens-Corning Series 1400 FR Spin-Glas® Board or equal material by Knauf, Schuller, Owens-Corning or CertainTeed.

- 7.3. Thickness:** Toilet exhaust duct: 1.0" thickness with reinforced foil kraft laminate jacket. All other locations: Minimum 2.0" thickness with reinforced foil kraft laminate jacket. Coordinate with variations specified above for additional layers and provide as required. Where internal acoustical insulation is specified, external insulation is not required. See limits of acoustical insulation in Part Duct Insulation Work (Internal) below. Regardless of external insulation requirements specified, insulation board is still required in mechanical rooms.
- 7.4. Manufacturer:** Johns-Manville Micro-Lite EQ, Type 150 or Type 75 with thickness and density as specified above. Equivalent material by Knauf, Schuller, Owens Corning or CertainTeed will be accepted.
- 7.5. Ducts to be Insulated Externally:** Concealed supply air ducts including ducts with liner, round outside air ducts, toilet/shower/housekeeping/janitor closet areas exhaust ducts, short branch duct collar connections to grilles, registers and diffusers, 24" upstream and downstream of each electric duct heater, supply air and return air duct and sleeves associated with wall mounted packaged units, all flexible connectors and exterior rim/cone of all ceiling diffusers. See Part "Duct Insulation Work (Internal)" for sound attenuating insulation requirements of externally insulated ductwork.

- 7.6. **Application:** Sheet metal duct shall be clean, dry and tightly sealed at all joints and seams before applying duct wrap. Adhere insulation to metal with 4" strips of Foster 85-60, ITW Miracle-Kingco M595 Ultratack or Childers CP-127, low VOC insulation bonding adhesive meeting ASTM C916 at 8" on center on circumferential joints. Wrap insulation tightly on the ductwork with all circumferential joints butted and longitudinal joints overlapped a minimum of 2". The 2" flange of the facing shall be secured using 9/16" flare-door staples applied 6" on center and taped as specified hereinafter. On longitudinal joints, the overlap shall be secured using 9/16" flare-door staples applied 6" on center and taped as specified hereinafter. For rectangular ducts wider than 23", additionally support insulation with weld pins and speed clips 18" on center. Stop and point insulation around access doors and damper operators to allow operation without disturbing wrapping. Insulate standing seams and stiffeners that protrude through the insulation with 2" thick, faced, flexible blanket insulation. Cover with reinforcing mesh and coat with vapor barrier finish coating. Vapor seal all seams, joints, pin penetrations, other breaks, circumferential and longitudinal joints with reinforcing mesh and coat with vapor barrier facing. Mesh shall be **4" wide pre-sized glass cloth** adhered and finished with two (2) coats of a white vapor barrier coating, Foster 30-33, Vimasco 749 or Childers CP-33. **No FSK tape will be allowed.** Fiberglass cloth shall be Great Lakes Textiles Style GL1658, 20x10 thread count per square inch, 0.004-inch thickness and 1.60 oz. /sq. yd., Childers Chil Glas #10 glass mesh, Foster Mast-A-Fab polyester mesh or equivalent product by 3M.
- 7.7. **Insulation Pins and Washers:** **The use of adhesives for attaching pins and washers to the ductwork is prohibited.** Pins shall be cupped-head, capacitor-discharge-weld pins, zinc-coated steel pin, fully annealed for capacitor-discharge welding, 0.135 inch diameter shank, length to suit depth of insulation specified with integral 1-1/2 inch galvanized carbon-steel washer. Insulation retaining washers shall be self-locking type formed from 0.016-inch thick galvanized steel with beveled edge sized as required to hold insulation securely in place but not less than 1-1/2 inches in diameter.

## **PART 8. DUCT INSULATION WORK (INTERNAL)**

- 8.1. **General:** All work by experienced applicators in accordance with manufacturer's recommendations. Duct liner, mastics and materials shall comply with all requirements and other building code requirements. All insulation materials (coatings and mastics) shall be fire resistive per NFPA Pamphlet No. 90A and 90B and shall be UL listed and shall have a fire hazard rating not to exceed 25 for flame spread and 50 for fuel contributed and smoke developed as determined by ASTM E84. Liner materials shall conform to the performance based ASTM C1071, which includes ASTM C518 Thermal Conductivity, ASTM C411 Temperature Resistance, ASTM C665 Corrosiveness, ASTM E84 Surface Burning Characteristics, ASTM C1338 Fungi Resistance, ASTM C1304 Odor Emissions and ASTM C1104 Moisture Vapor Sorption.
- 8.2. **Material:** Liner shall be a GreenGuard certified, low VOC, Type I liner as defined by ASTM C1071 and characteristics complying with ASTM E 84, UL 723, NFPA 255, NFPA 259 and ASHRAE 62. It shall have an acrylic coating formulated with an immobilized, EPA registered, protective agent to protect against growth of fungi and bacteria as required by ASTM C1071 and tests conducted in accordance with ASTM C 1338, ASTM G21 and ASTM G 22. It shall not support microbial growth and have glass fibers bonded with a thermosetting resin. The airstream surface shall be protected with a reinforced coating with flexible glass cloth reinforcement. The liner shall have a reinforced factory applied edge coating and operate in an environment

of a maximum of 250°F and maximum of 6,000 fpm air velocity. Thermal conductivity per ASTM C-518, at its rated thickness, shall be not less than  $k=0.16 \text{ BTU} \cdot \text{in}/(\text{hr} \cdot \text{ft}^2 \cdot ^\circ\text{F})$  and  $R=6.3$  at 75 F mean temperature in accordance with ASTM C18. Sound absorption coefficients for the liner shall be per ASTM C 423 and ASTM E 795 test methods and the table below. **Furnish sound characteristics for approval with the material submittal.**

**Sound Absorption Coefficient at Frequency**

Thickness (In)	(Cycles per Second)						NRC
	125	250	500	1000	2000	4000	
1.5	0.10	0.47	0.85	1.01	1.02	0.99	0.85
2.0	0.25	0.66	1.00	1.05	1.02	1.01	0.95

- 8.3. Manufacturer:** Shall be Johns Manville Linacoustic RC or equivalent material by Schuller, Knauf, Pittsburgh, CSG, Owens Corning or CertainTeed.
- 8.4. Thickness:** 1.5 inches thickness.
- 8.5. Ducts and Equipment to be Insulated Internally:** Exposed supply air ducts in areas without ceilings, outside air ducts, make-up air ducts, return air ducts, return air plenums, transfer air (jumper) ducts and relief air ducts.
- 8.6. Acoustical Duct Lining:** Line the first twelve (12) linear feet of all single wall, supply and return air ducts downstream of all heat pumps, air handling units, packaged units, 100% outside air units, ducts downstream of VAV terminal units, classroom or shop area exhaust ducts interlocked with lighting circuits and transfer air (jumper) ducts with insulation equal to Johns Manville Linacoustic RC and **2.0" thickness**. Sound absorption characteristics shall be as specified above.
- 8.7. Application:** Adhere insulation to the entire surface of the sheet metal with fire resistive, low VOC, UL labeled, fire resistive, water based, ASTM C 916, Type II compliant adhesive before the metal is broken. Adhesive shall be Foster 85-60 or Childers CP-127. Secure all sheets wider than 24 inches with sheet metal screws and washers or stud pins and clips 16 inches on center, each way. Joints shall be straight and smooth and shall be buttered with adhesive to prevent erosion and improve airflow. Product shall have factory applied edge coating to assure sealing of transverse edges per current SMACNA and NAIMA installation standards.
- Damage to the liner shall be repaired using Johns Manville SuperSeal products as required or equivalent materials by other manufacturers with their specific equivalent products.
- 8.8. Metal Nosings:** All exposed leading and trailing edges shall be secured with **sheet metal nosings to protect insulation edges**. Metal nosings shall be securely installed over all transversely oriented liner edges facing the airstream at forward and rear discharge towards coils, dampers, ducts, plenums, changes of insulation thicknesses of adjoining insulation, any exposed insulation ends and at any point where lined duct is preceded by unlined duct. See detail on the plans. All remaining miscellaneous exposed edges shall be sealed/coated. There shall be no exposed fiberglass ends in the airstream.

## **PART 9. REGISTERS, GRILLES AND DIFFUSERS**

- 9.1. General:** All grilles, registers and diffusers shall be product of a single manufacturer; shall be constructed of extruded aluminum with baked enamel finish with color as selected by the Architect. Architect may require painting of the diffusers, grilles, registers, etc., in the field. Where field painting is required, diffusers, grilles and registers shall be factory primed for painting in the field. Refer to Architectural Section "Painting", coordinate requirements and provide finish as required. Where lay-in type panels and frames are specified, check ceiling suspension system and coordinate interfacing. All grilles, registers and diffusers not in integral lay-in metal panels shall be mounted with aluminum-countersunk screws with finish to match respective items. All grilles, registers and diffusers shall be ADC or approved equivalent Agency certified.
- 9.2. Square Ceiling Diffusers with Round Neck:** Titus Model TMSA-AA, Price ASCDA, removable core type, aluminum construction, with baked enamel finish color selected by the Architect, designed for four-way diffusion complete with Titus AG-85, Price VCR8E steel butterfly blade damper. Diffuser face shall be 24" x 24" with type frame to interface with ceiling system. Use lay-in type frame where lay-in ceilings occur.
- 9.3. Wall Return Air Registers:** Titus Model 33R-PF, Price Model 91-L-D-A-VCS3 gymnasium heavy duty steel register with 38 degree deflection 14 ga. blades, support bars on 6" centers Allen key operated aluminum opposed blade damper and auxiliary mounting frame all finished with baked enamel finish color to be selected by the Architect.
- 9.4. Wall Return Air / Wall Exhaust Air & Double Face Wall Grilles:** Same as wall return air registers except without dampers.
- 9.5. Ceiling Mounted Exhaust Air and Return Air Registers:** Titus Model 50-F-0-5-D-25, Price Model 80DAL-F-SW-A all aluminum fabricated egg-crate type with baked enamel finish color to be selected by the Architect, Allen key operated aluminum opposed blade damper and lay-in type frame. Where lay-in ceilings occur, each register shall have integral 2' x 2' or 2' x 4' aluminum modular lay-in ceiling panel with finish to match diffuser.
- 9.6. Ceiling Mounted Return Air or Relief Air Grilles and Air Transfer (Jumper Duct) Grilles:** Same as return air registers except without dampers.
- 9.7. Brick Vents for Exhaust Fan Discharge:** Extruded aluminum, Reliable #RBV brick and block vent with #4 mesh removable aluminum screen and integral water stop. Finish shall be factory paint color to be selected by the Architect.
- 9.8. Wall Louvers for Fresh Air Intake:** Specified (together with screen) under Division 10 of specifications.
- 9.9. Expanded Metal Grilles:** Provide metal grille equal to McNichols Co., flattened expanded metal, galvanized, hot dipped, 3/4, #16 flattened, minimum 70% open (free) area with U-Edging to protect occupants from injury. Grille shall be factory primed for painting in the field as directed by the Architect.
- 9.10. Equal Products:** By Titus, Price, Krueger and Metalaire will be accepted.



## PART 10. CONDENSATE DRAINAGE PIPING

- 10.1. **General Workmanship:** Cut accurately to measurements established at site and work into place without springing or forcing, properly clearing all building features. Route through previously built-in sleeves and avoid cutting or other weakening of the structure. Cap or plug open pipe ends during installation to keep out foreign material.

Make all connections to equipment using unions. Install unions in all piping connections to each piece of equipment, including traps, pumps, coils, etc.

- 10.2. **Condensate Drain Piping and Drain Pipe from Drip Pans to Floor Drains:** Type M hard copper tubing with wrought copper solder joint fittings. Outdoor wall mounted packaged units shall be provided with Schedule 40 galvanized steel drainage piping and fittings or Schedule 80 solid wall PVC pipe and fittings meeting ASTM Standard D2665 and 1785 with UV protective coating or painted on UV protection. Provide a trap in each drain line with capped or plugged cleanout tees. **Cell core piping is expressly forbidden.** Trap depth shall be as required by the equipment Manufacturer. In absence of the equipment Manufacturer's trap requirements, traps shall be equal to the total system pressure plus one inch. Provide an electric switch, conforming to UL 508, to shut down the unit should the line become obstructed.

- 10.3. **Copper Joints:** Make assemblies with tin-antimony (95-5) solder and non-corrosive flux (this does not apply to refrigerant piping). Clean and polish the tube and the inside of the fittings, using No. 60 steel wool. Apply flux and place fitting on the tube. Heat joint evenly, but take care not to overheat fitting. Apply solder until a solder line shows completely around the joint. Remove surplus solder and allow joint to cool.

- 10.4. **Escutcheons:** Provide all pipes passing through the floors, walls or ceilings of finished rooms with chrome plated brass escutcheon plates securely fastened in place with round head set screws.

- 10.5. **Unions:** Unions shall be of the following types:

**Copper Lines:** Ground joint, copper to copper.

**Schedule 80 PVC:** Solid wall PVC schedule 80 DWV pipe and fittings meeting ASTM Standard D2665 and 1785 for above ground service and underground service.

**Dielectric Unions:** Provide where copper pipe joins to steel pipe, EPCO or approved equivalent. Contractor shall provide a globe valve on each side of each dielectric union to allow for replacement of the union.

- 10.6. **Expansion:** Provide for expansion and contraction of all piping and make proper provisions so that there will be no undue strain on any pipe or equipment.

- 10.7. **Sleeves:** Refer to Section 15010, Para. B. 4. Pipe Sleeves.

## PART 11. REFRIGERANT PIPING AND ACCESSORIES

- 11.1. **General:** Pre-charged refrigerant line sets are NOT allowed. Refrigerant piping shall be Type L hard drawn, ACR copper refrigerant tubing with long radius wrought copper solder joint fittings. System shall be complete and sized to conform to current ACRMA standards, except that refrigerant suction risers shall be sized for a gas velocity not less than 2000 fpm.

Where refrigerant piping is shown rising in the wall cavity and requires modifications to the block wall due to the size of the piping and insulated assembly, the block shall be neatly saw cut. Provide reinforcing to the affected portions of the wall as indicated on the structural drawings and details, the same as required at window and door openings. See the structural drawings for specifics. Extreme coordination is required prior to the erection of the structural slab and wall. Coordinate with the General Contractor.

Refer to Section 15010 and provide wall sleeves and escutcheons as specified for typical piping. Sleeves for pipe passing through exterior walls that contain refrigerant piping shall be Schedule 80 PVC pipe, 1/2" larger in diameter than piping and piping covering. Refer to Section 15010, Sleeves and Firestopping for additional requirements. Taping or nylon pull tying of liquid lines to suction lines is not allowed. Refer to Section 15010 and below for requirements. Coordinate wall sleeve sizes required for refrigerant piping with insulation and aluminum jacket requirements. Piping within wall cavities shall be seamless type with no joints.

- 11.2. **Joints:** Brazed or soldered joints only. Flare joints are not allowed. Make up with high temperature silver solder suitable for twice (2x) the working pressure, at maximum capacity, of the system. Pass dry nitrogen gas through pipe while joints are soldered. No joints shall be allowed within any masonry walls or any other inaccessible area. Solder shall be Sil-Fos 15 or approved equivalent. All soldering or brazing, materials and methods used shall be as recommended by the unit manufacturer. Piping within wall cavities and other inaccessible areas shall be seamless type with no joints.
- 11.3. **Piping Diagram:** Various manufacturers of heat pump and DX systems have different reasons for the use of loops, traps, accumulators, receivers, etc., in piping arrangements, therefore, submit for approval, a Manufacturer's recommended, dimensioned plan view and isometric piping diagram proposed for use for each system, showing all valves, loops, pipe sizes and all appurtenances, required for the proper operation of the respective system. Secure approval of compressor and unit manufacturer before submitting. **No diagram will be reviewed without the respective Manufacturer's written acceptance and approval.** Submit catalog data and manufacturer's ratings for all valves, catch-alls, etc. with diagram for each system. Identify all items for respective system and list capacities, pressure drops, etc.
- 11.4. **Solenoid Valves (Where Required):** Install in liquid refrigerant connection to the evaporators. Valves shall be designed for the operating pressure and capacity as listed in manufacturer's catalog with a pressure drop not exceeding 2 psi, and shall be sufficient for the requirements of the installation. Install in horizontal runs with body vertical.
- 11.5. **Expansion Valves (Where Required):** Properly sized diaphragm or bellows type, with external superheat adjustment set for 10 degrees F. superheat. Install in the liquid refrigerant supply lines to the evaporators. Expansion valves up to and including 7-1/2 tons capacity shall be Sporlan Type "S" or approved equivalent. Expansion valves over 7-1/2 ton capacity shall be Sporlan Type "O" or approved equivalent. Install Sporlan full size catch-all filter-drier ahead of valve.
- 11.6. **Service Valves:** Provide where indicated on plans and/or required for the proper servicing of the equipment. Install **locking** refrigerant valves in the suction and discharge lines adjacent to the compressor unless **locking** type built-in double

seated valves are furnished. The refrigerant valves shall be designed for the refrigerant used and have seal caps.

**11.7. Refrigerant Filter Drier (Catch-all):** Install in refrigerant line on the inlet side of each thermostatic expansion valve a Sporlan, three desiccants type filter drier. Filter driers up to and including 10 ton capacity shall be sealed type. Filter driers over 10 ton capacity shall be replaceable core type. Units shall have minimum surface filtering area and capacity not less than that shown in Sporlan Valve Company Bulletin 40 10 under sizes for "field replacement or field built up sizes". Careful attention must be given to providing the correct type of filter drier as it pertains to type of refrigerant used in the respective system.

**11.8. Pipe Sleeves:** See Section 15010 for requirements.

**11.9. Pipe Supports:** All refrigerant piping, regardless of size, shall be supported with unistrut assemblies. Provide unistrut assembly, supporting horizontal refrigerant piping on intervals not exceeding 10 feet. Provide dielectric separation between dissimilar metals. Support piping so that no vibration will be transmitted to the building structure, using spring type hangers as required.

Provide an insulated piping clamp assembly at each unistrut hanger, including the liquid line and any bare copper line attached to the assembly. The insulated clamp shall provide a crush resistant air tight seal and shall consist of a rigid, closed cell, foam insulation to support tubing and absorb vibration. The outer cover shall consist of a rubber coating that seals the cushion completely after installation to prevent condensation. **Plastic inserts/connectors between insulation joints are prohibited.** Clamps shall be steel with electrochromate finish. Rated assembly temperature range shall be -50°F to +250°F. It shall be self-extinguishing as tested under ASTM D 635. Insulated lines shall use ZSi Series Cush-A-Therm or approved equivalent.

For units on concrete pad, support piping on concrete pad with rustproof coated 1-1/2" x 1-1/2" x 1/8" galvanized steel angle supports anchored to pad with steel base plate and bolts. See Part "Hangers and Supports" for coating requirements of unistrut assembly.

## **PART 12. PIPE HANGERS AND SUPPORTS**

**12.1. General:** Refer to Section 15010.

**12.2. Painting of Hangers and Supports:** All exposed ferrous metal parts of hangers, unistrut and other assemblies used for supporting of ducts, piping and plumbing related items in mechanical rooms, crawl space, above ceilings, etc., including black steel pipe, uncoated cast iron pipe, hangers, brackets, etc. shall be painted with two coats of black latex paint. Paint shall have a fire hazard rating not to exceed 25 for flame spread and 50 for fuel contributed and smoke developed as determined by ASTM E84, In lieu of painting, the contractor may substitute factory painted or coated items. All paints and coatings shall have a fire hazard rating not to exceed 25 for flame spread and 50 for fuel contributed and smoke developed as determined by ASTM E84.

## PART 13. PIPE AND MISCELLANEOUS INSULATION WORK

- 13.1. **General Provisions:** All work by experienced applicators in accordance with manufacturer's recommendations. Installation shall be as recommended by the Manufacturer. Where specified installation is in conflict with the Manufacturers recommendations, the strictest application shall be provided. Piping must be clean, dry and pressure tested before covering is applied. Size pipe hangers to fit over insulated pipe size. **Hangers shall not be in contact with bare pipe and shall not penetrate the vapor barrier.** See hangers and supports. Cover fittings, valves and flanges with insulation material as hereinafter specified to same thickness as adjacent pipe covering except screwed unions in hot piping and other specifically named items. Neatly bevel covering edges adjacent to unions and other points of termination. All insulation materials including coatings and mastics shall have a composite rating for insulation, jacket or facing, including adhesives, not to exceed 25 flame spread and 50 for fuel contributed and smoke developed as determined by ASTM E-84, NFPA 255 and UL 723.

- 13.2. **Refrigerant Suction Lines and All Hot Gas Reheat Coils Hot Gas and Liquid Lines:** All insulated piping shall be continuous without cutting at clamp/support assemblies. All refrigerant liquid lines which are not associated with a hot gas reheat coil are not required to be insulated except, they shall be provided with insulated insert at clamps to unistrut assemble. See Part Refrigerant Piping and Accessories for refrigerant piping support and clamp assembly required. Various Manufacturers of "min-split" systems require the insulating of refrigerant liquid lines. When required by the Manufacturer, they shall be insulated using materials specified below and in thickness required by the respective Manufacturer.

Insulate with UL fire and smoke rated nominal 1" thickness, black, flexible foamed, elastomeric, closed cell pipe insulation by AP Armaflex or equivalent by K-Flex or Aerocel AC EPDM. It shall be GreenGuard certified tubular insulation with Microban antimicrobial protection. Insulation shall have a 'k' factor of not more than 0.256 at 90°F mean temperature, water absorption percent by volume of 0.2 and a water vapor transmission rate of 0.05 perm-inches or less.

Slip insulation onto pipe prior to erecting. **Longitudinal cutting of the insulation is prohibited. Do not stretch or bend insulation at any turn, nor slide insulation over sweat fittings.** Insulate sweat fittings and elbows with miter-cut pieces of insulation as recommended in Armaflex installation instructions, the same size as on adjacent piping. On piping with screwed fittings, make up fitting covers from Armaflex with an inside diameter large enough to overlap the insulation on the pipe next to the fitting. Fitting cover shall be long enough to overlap the pipe insulation by a minimum of one inch on each side. Glue the 1" overlap and seal to the adjacent pipe insulation with same adhesive and tape specified hereinbefore. Seal all butt joints with Armaflex BLV, Black, low VOC, air drying contact adhesive. After gluing joints, wrap joint with 2" wide, 1/8" thick AP/Armaflex self-adhering tape.

Paint all insulation in mechanical rooms (not in the attic) with two coats of Rubatex 374 white.

- 13.3. **Refrigerant Piping and Condensate Drainage Piping Aluminum Jacket:** All insulated exterior refrigerant piping, insulated exterior hot gas reheat coils hot gas piping and all insulated condensate drainage piping terminating in janitor sink, floor sink or any location that would subject the piping insulation to damage shall be covered with an aluminum jacket. Where refrigerant piping rises within the wall cavity

to above the ceiling, attic or similar space, the aluminum jacket shall terminate within the exterior wall cavity and sealed weather tight to the sleeve in the wall. Where the refrigerant piping extends from the outside, directly into the mechanical room, the aluminum jacket shall terminate a minimum of 8" into the space and sealed weather tight on both sides of the wall. The aluminum jacket shall be 20 mil (.02") thick, smooth finish, 3003 and 3105 series aluminum conforming to ASTM B-209 standards. Fittings shall be 20-mil (.02") thick, die shaped, and smooth finish, Type 1100 aluminum jacket meeting ASTM C585. Provide 1/2" wide, 20-mil (.02") thick, Type 3003 aluminum bands on maximum 24" centers but not less than two bands per jacket section. **VentureClad or similar product is prohibited.**

- 13.4. **Condensate Drain Lines:** To include discharge lines on all equipment specified with or provided with air conditioning condensate drainage pumps. Same as refrigerant piping except 1/2" thickness.
- 13.5. **Painting and Identifying:** Paint and identify after installation is completed as specified in Section 15010. Provide identification on the insulation covering indicating unions, strainers and check valves.
- 13.6. **Submittal Data:** Submit for approval complete data on materials and application methods proposed.
- 13.7. **Manufacturers:** Approved equivalents by Pittsburgh Corning, CertainTeed, Baldwin-Ehret-Hill, Manville, Owens Corning, Armstrong Childers and 3M Company will be accepted.

## **PART 14. VENTILATION**

- 14.1. **General:** Provide all fans complete with ducts, grilles, curbs and required accessories. Roof caps shall be painted with two coats of non-reflective paint. Paint type and color as selected by Architect. All roof curbs, etc., furnished shall adhere to the roofing manufacturer's requirements so as not to void the roofing warranty. Coordinate roof caps and interface in the building roofing system and verify minimum net height to be as required by code or as required by Architect. Refer to architectural specification. All fans shall be AMCA certified in accordance with Standards #210 and 300. Fans wheels shall be balanced in accordance with AMCA Standard 204-05. Fans shall be UL 705 listed and shall bear the UL Label. Furnish for approval capacity and sound power ratings. All motors 1/2 HP and smaller shall have built-in overload protection.
- 14.2. **Ceiling Mounted Cabinet Fans:** Penn Ventilator Company Model Zephyr, Series Z-3 thru Z-15, or approved equivalent, complete with all accessories, including unit mounted solid state speed control switch, factory baked enamel white aluminum ceiling grille, metal flanged inlet and outlet connections, acoustically insulated metal housing, direct driven, centrifugal fan that is internally isolated for vibration, integral backdraft damper and terminal cap, cast aluminum brick vent or soffit grille as shown on the plans. Fan shall be supported from the structure with 1/4" hanger rods, rubber in shear vibration isolators and Manufacturer furnished bracket for attaching rods to the fan. Do not allow full weight of fan to be carried by the ceiling grid.
- 14.3. **Cabinet In-Line Centrifugal Fans:** Loren-Cook Series "SQ" in-line centrifugal type fan as shown on the fans schedule. Fan shall have 18 ga. galvanized steel cabinet with integral duct collars, bolted access doors on 3-sides which are sealed with closed cell neoprene gasketing, disconnect switch, centrifugal, backward inclined

extruded aluminum fan wheel and cast aluminum hub, supports for ceiling suspension, permanently lubricated drip proof motor, and gravity type discharge damper and Manufacturer furnished VFD if indicated or specified. Bearings shall be heavy duty, L50 life in excess of 200,000 hours at maximum cataloged operating speed. Bearings shall be regreaseable ball type with extended fittings in a pillow block cast iron housing. Coordinate fan arrangement required (top, side and bottom) at the site, prior to ordering fan.

- 14.4. **Acceptable Manufacturers:** Cook, Acme, Greenheck, PennBarry.

## **PART 15. SPLIT SYSTEM HEAT PUMP UNITS**

- 15.1. **General:** Furnish and install split system heat pump systems as manufactured by the Trane Company, or approved equivalent by Carrier, or Lennox. Each unit shall be completely factory assembled and tested, and shall include hermetic compressor, outdoor (condenser & evap) coil, condensate switch to shut unit down should condensate drain line become obstructed, fan and ECM motors, interconnecting wiring, low voltage control transformer, prewired control panel and other necessary components mounted in weather resistant steel cabinet with baked on enamel finish. The unit shall be UL or ARL (Applied Research Labs) listed and labeled accordingly. The heat pump shall be sound rated per ARI Standard 270 and operation sound level shall not exceed acceptable limits. Heating and cooling capacities shall not be less than those indicated on the drawings. Indoor unit shall be provided with single point power connections (fan and heater). **Verify voltage and power requirements with Electrical Contractor and Electrical plans prior to ordering equipment.**
- 15.2. **Special Considerations:** The equipment manufacturer shall size the refrigerant piping for all the units and shall furnish all accessories and auxiliaries required for a complete and proper installation for the specific application shown on the drawings and the specified sequence of operation. Refer to Section Refrigerant Piping and Accessories for additional requirements.
- 15.3. **Cabinet:** Heavy gauge galvanized steel cabinet with weather resistant baked enamel finish. Access to the electrical controls and compressor shall be made by removing two service panels.
- 15.4. **Compressor System:** The unit shall contain a hermetic compressor. The compressor shall have high and low pressure protection, sump heat and compressor overload protection. Refrigerant circuit shall include **lockable** service valves, lockable pressure tap ports, check valves, switch over valve, refrigerant line filter-driers, and factory furnished holding charge of R-410a. Compressor shall be designed, manufactured and warranted for five years by the air conditioning unit manufacturer.
- 15.5. **Outdoor Coil:** The outdoor coils shall be constructed of aluminum fins or Spine Fin mechanically bonded to seamless aluminum or copper tube and shall be protected by a unit manufacturer furnished, heavy-duty metal hail guard. The outdoor coil shall have expansion valve refrigerant control during heating operation, and automatic time and temperature actuated defrost control system. Unit shall, as factory shipped, cycle fan motor on outdoor thermostat for low ambient cooling down to 45°F outdoor temperature. Provide heavy duty metal condenser coil hail guard.

- 15.6. **Controls:** Controls shall be factory wired and readily accessible. Compressor shall have overload protection; high and low pressure cutouts, 24-volt control transformer and magnetic contactor.
- 15.7. **Air Handler:** Air handler cabinet shall be constructed of heavy gauge steel with baked enamel finish and be internally lined with foil laced fiberglass insulation. The indoor coil shall be constructed of aluminum plate fins mechanically bonded to seamless copper tubes. The indoor (evaporator) coil shall have expansion valve control and be equipped with defrost control. Indoor blower shall be of the centrifugal type, forward curved and shall be driven by a direct drive or a belt drive motor with variable pitch pulley, high static drives as required to meet specified static pressures and permanently lubricated ball bearing motor. Air handler shall be provided with low voltage terminal board and fan motor relay. Refer to drawings for specific drive requirements.
- 15.8. **Electric Heaters:** Provide electric heater with a total heating output not less than indicated on the drawings. Heater assembly shall include power supply fusing, automatic resetting limit switches and heat limiters for thermal protection. Heater shall be provided with factory disconnect switch and fusing all per National Electrical Code and UL. Additionally, the auxiliary heater cabinet shall be factory sealed air tight and insulated to prevent condensation.
- Where the auxiliary resistance heater is specified for maintaining space temperature during dehumidification, the auxiliary resistance heater shall be provided in a minimum of two stages. See controls specification for additional information.
- 15.9. **Indoor Thermostat:** Provide a combination 7-day programmable, two-stage heating manual changeover heat pump thermostat. Thermostat shall have outdoor thermistor to compensate for thermostat droop, emergency heat switch with indicator light and auxiliary heat light. Thermostat shall have sub-base fan switch for "On-Auto" selection and manual "Heat-Cool" switch. Thermostat shall be hardwired and be provided with battery back-up. Provide hinged metal guard with rounded corners, lock and key for each thermostat. Refer to Section 15920 for additional requirements
- 15.10. **Outdoor Thermostat:** Provide mounting box. Provide one outdoor thermostat for control of second stage of electrical heaters.
- 15.11. **Power Wiring:** Unit shall be factory wired for power supply indicated on the electrical drawings. Any variation will be the responsibility of the contractor.
- 15.12. **Filter Frame and Filters:** Provide 2" thick, MERV 8, pleated filters equal to 30/30/ Farr Series. All filters shall be common industry standard size filters that are readily available and do not have to be fabricated. Cutting and taping of filter segments to make a proper filter is prohibited. Where indoor section sits on R.A. platform or is horizontally mounted in an attic space and the manufacturer does not provide a filter access with thumbscrew access in the bottom of the unit, provide a filter frame that is designed to mount to the bottom (R.A. inlet) of the air unit. Frame shall be hinged and have thumbscrews or wing nuts to open the access door. Filter frame shall be as manufactured by E-Z Filter Base Mfg., Inc. or approved equivalent. **The Contractor is responsible for quarterly filter changes during the guarantee period and shall inscribe onto the filters' casing the date filters were installed/replaced.**
- 15.13. **Phase Protection:** All indoor and outdoor equipment shall also be provided with surge protection and phase protection to insure against voltage unbalance,

over/under voltage, phase loss, reversal, incorrect sequencing and rapid short cycling. Protection shall be provided for all 3 phase equipment utilizing ICM Controls Model 450 or equivalent. All single phase equipment with horsepower greater than or equal to 1/8 HP shall be provided with protection utilizing ICM Controls Model ICM 492 or equivalent. Where phase protection device can not be mounted within the respective equipment, provide a NEMA 4x or NEMA enclosure appropriate for the installation. The Contractor shall consult with the Owner's maintenance personnel and set up all programmable options based on the Owner's requirements, within the device's capabilities.

- 15.14. Pad Mounted Supports:** Units shown on finished grade shall be anchored to the concrete pad. Concrete pads are specified under Division 2. Where concrete pads are not specified or not shown elsewhere, the Mechanical Contractor shall be provide a minimum 4" thickness, 3,000 psi concrete pad with rounded edges and corners. Pad shall extend a minimum of 12" around three (3) sides of the unit and terminate at the building outside wall. Provide a strip of asphalt expansion joint between the concrete pad and the building exterior wall. Expansion joint shall be full width by full depth of concrete pad, 1" thickness, non-absorbing, self-sealing, ASTM D 994 compliant as manufactured by W.R. Meadows Inc. or approved equivalent.

- 15.15. Warranty:** General warranties are specified in Section "General Mechanical Provisions". The Contractor shall provide a non-prorated, total of five year parts and labor, Manufacturer's warranty on outdoor unit compressor(s). The manufacturer's warranty shall provide for the repair and/or replacement of the compressor(s) that become inoperative because of defects in material or workmanship. The warranty period shall begin on the same date as final acceptance of the installation and shall continue for the full product warranty period specified above. The warranty shall include refrigerant and all other costs associated with the compressor(s) shipment to the Contractor or Facility, compressor(s) replacement, installation and returning the unit to its proper operating condition. The Contractor shall respond within 24 hours upon notification that a compressor has failed under the terms of the warranty. "Respond" shall mean having a Manufacturer certified technician on site to evaluate the extent of the needed repairs and ordering of all items required for repair.

Additionally, a 5-year entire unit parts and labor warranty shall be provided for each unit from unit Manufacturer.

## **PART 16. WALL MOUNTED DUCTLESS SPLIT HEAT PUMP SYSTEM UNIT (DHP)**

- 16.1. General:** Provide ductless, wall mounted, split system type heat pump unit, equal to Mitsubishi Electric Series PKA/PUZ complete with all accessories including wall hung evaporator blower unit, pad mounted outdoor condensing unit with **lockable refrigerant charging valves**, filter frame, filter, fixed, wall mounted, 7-day programmable, microprocessor electronic thermostat and control module, adjustable discharge louvers, factory installed heavy duty condensate pump (if drainage indicated on plumbing plan is not gravity type), alarm for obstructed condensate line, low ambient indoor coil thermistor, low ambient control to 0° F, outdoor microprocessor control, heavy duty metal condenser coil hail guard and other accessories required for a complete functional installation. Unit shall be provided with sensor to shutdown unit and sound alarm if condensate line becomes obstructed. If BAS system is part of the project, provide output contacts to show alarm at BAS system Operator Console. Coordinate with BAS Contractor and provide as required for proper interface. Refrigerant shall be R-410a. Compressors shall be warranted for 5 years.



- 16.2. Refrigerant Piping:** The equipment manufacturer shall size the refrigerant piping for all the units and shall furnish all accessories and auxiliaries required for a complete and proper installation for the specific application shown on the drawings and the specified sequence of operation. Refer to Section Refrigerant Piping and Accessories for additional requirements.
- 16.3. Condensate Pump (As Required):** Condensate pumps for all indoor units shall be Blue Diamond, Series MaxiBlue or approved equivalent. Pump shall be thermally protected, up to 3.7 GPH flow rate, 23 ft. head, 15 ft. suction, self-priming, powered by the indoor unit and maximum 21-db sound level. Pump shall be provided with mounting feet, extension cables and multi-tank configuration as required. Mechanical Contractor to coordinate power requirements for pump, prior to bid, and provide as required.
- 16.4. Roof/Pad Mounted Supports:** Concrete pad is specified under Division 2 for all units mounted on grade. Where concrete pads are not specified or shown, the Mechanical Contractor shall provide a minimum 4" thickness, 3,000 psi concrete pad with rounded edges and corners. Pad shall extend a minimum of 12" around three (3) sides of the unit and terminate at the building outside wall. Provide a strip of asphalt expansion joint between the concrete pad and the building exterior wall. Expansion joint shall be 1" thickness, non-absorbing, self-sealing, ASTM D 994 compliant and manufactured by W.R. Meadows Inc or equivalent.
- 16.5. Phase Protection:** All indoor and outdoor equipment shall also be provided with surge protection and phase protection to insure against voltage unbalance, over/under voltage, phase loss, reversal, incorrect sequencing and rapid short cycling. Protection shall be provided for all 3 phase equipment utilizing ICM Controls Model 450 or equivalent. All single phase equipment with horsepower greater than or equal to 1/8 HP shall be provided with protection utilizing ICM Controls Model ICM 492 or equivalent. Where phase protection device can not be mounted within the respective equipment, provide a NEMA 4x or NEMA enclosure appropriate for the installation. The Contractor shall consult with the Owner's maintenance personnel and set up all programmable options based on the Owner's requirements, within the device's capabilities.
- 16.6. Warranty:** General warranties are specified in Section "General Mechanical Provisions". The Contractor shall provide a non-prorated, total of five year parts and labor, Manufacturer's warranty on outdoor unit compressor(s). The manufacturer's warranty shall provide for the repair and/or replacement of the compressor(s) that become inoperative because of defects in material or workmanship. The warranty period shall begin on the same date as final acceptance of the installation and shall continue for the full product warranty period specified above. The warranty shall include refrigerant and all other costs associated with the compressor(s) shipment to the Contractor or Facility, compressor(s) replacement, installation and returning the unit to its proper operating condition. The Contractor shall respond within 24 hours upon notification that a compressor has failed under the terms of the warranty. "Respond" shall mean having a Manufacturer certified technician on site to evaluate the extent of the needed repairs and ordering of all items required for repair.
- Additionally, a 5-year entire unit parts and labor warranty shall be provided for each unit from unit Manufacturer.
- 16.7. Manufacturers:** Mitsubishi or equivalent by Trane, Lennox, Samsung or Carrier. **Mitsubishi is the basis of Design.**

## **PART 17. WALL MOUNTED HEAT PUMP UNITS (Outdoor Installation)**

- 17.1. General:** Furnish and install self-contained wall mount air-to-air heat pump units suitable for outdoor use. The wall mount unit shall be completely factory assembled and tested, and shall include compressor, indoor and outdoor coils, fans and motors as required, prewired controls, interconnecting refrigerant tubing, wiring, factory installed circuit breakers (disconnect), factory installed single point power connection, indoor blower fan speed control, wall sleeve, gaskets and other necessary components required for an air and water tight seal at the wall and mounted in a corrosion resistant cabinet. Coordinate sleeve depth required with Architectural plans and provide as required. When the facility is provided with a Building Automation System, unit shall be provided with appropriate relays for connecting to it. Unit shall be from the factory with a full operating refrigerant and oil charge. The units shall be provided with phase protection across all legs. When mounting equipment to the wall, do NOT use drive pins. Use a screwed anchor type device so that the unit may be easily removed for service, replacement, etc. Prior to mounting the unit, the contractor shall apply bead mastic or silicon caulk to the flange of the unit and immediately set the unit in place. This will provide a tight seal between the unit flange and the exterior wall at the time of setting the unit in place. The complete package shall be UL listed and ARI Standard 240-81 certified. Unit shall be U.L. or ETL listed and bear the testing agency's label. The entire unit shall be factory wired for single point power connection. **Verify voltage and power requirements with Electrical Contractor and Electrical plans prior to ordering equipment.** Unit shall be equivalent to Marvair Series Classic or approved equivalent by Bard or Airedale. Provide color samples to Architect for color selection of grilles, cabinet, etc.
- 17.2. Cooling and Heating Capacity:** Total net heating and cooling capacity of each unit shall be as scheduled on plans. Provide supplemental electric heat as shown on the equipment schedule.
- 17.3. Cabinet:** The cabinet shall be constructed of zinc-coated, galvanize, G-90, steel with factory applied paint. Cabinet color shall be selected by the Architect. The cabinet shall include built-in mounting flanges and built-in sloped top. The conditioned air section shall be insulated with ½ inch, 2 pound dual density fiberglass. The internal control box shall be insulated to protect electrical components from condensation. The control box components shall be labeled and the electrical wiring shall be color-coded. Two inch, pleated, MERV 8, disposable type filter shall be mounted internally, factory supplied, and accessible through a hinged type panel. All filters shall be common industry standard size filters that are readily available and do not have to be fabricated. Cutting and taping of filter segments to make a proper filter is prohibited. It shall provide filtration for both outside air and recirculated air. **The Contractor is responsible for quarterly filter changes during the guarantee period and shall inscribe onto the filters' casing the date filters were installed/replaced.**
- 17.4. Compressor:** The compressor shall be 2-stage and operate with R-410a refrigerant, be hermetic, scroll type, and shall be equipped with an immersion type self regulating crank-case heater. The refrigeration circuit shall contain a suction-line accumulator, liquid filter dryer and **lockable** suction and liquid access valves. The refrigeration circuit shall be protected from high pressure and loss of charge operation by a positive lock out device. The compressor shall be protected by a factory installed adjustable time delay relay.

- 17.5. **Phase Protection:** All equipment shall also be provided with surge protection and phase protection to insure against voltage unbalance, over/under voltage, phase loss, reversal, incorrect sequencing and rapid short cycling. Protection shall be provided for all 3 phase equipment utilizing ICM Controls Model 450 or equivalent. All single phase equipment with horsepower equal to or greater than 1/8 HP shall be provided with protection utilizing ICM Controls Model ICM 492 or equivalent. Where phase protection device can not be mounted within the respective equipment, provide a NEMA 4x or NEMA enclosure appropriate for the installation. The Contractor shall consult with the Owner's maintenance personnel and set up all programmable options based on the Owner's requirements, within the device's capabilities.
- 17.6. **Outdoor Section:** The outdoor coil shall be constructed of aluminum plate fins mechanically bonded to seamless copper plate fins mechanically bonded to seamless copper tubes. Outdoor fan shall be direct driven, slow speed propeller type for quiet operation. The outdoor motor shall be equipped with a thermal protector.
- 17.7. **Hot Gas Reheat Coil:** Each unit shall be provided with a refrigerant hot gas heating coil in the reheat position for humidity control. The coil shall be of sufficient size to reheat all of the supply air. Provide, complete, with all necessary valves, controls, etc., as required for a complete and properly functioning installation. Provide manual isolation valves for each hot gas and liquid lines. Furnish for approval air conditioning equipment manufacturer approved refrigerant piping and controls diagram, and statement by the air conditioning manufacturer on company letterhead that use of the hot gas reheat coil with the equipment is acceptable to the manufacturer and does not affect any warranty or guarantee. **Equipment submittal will not be reviewed without a manufacturers' approved diagram and referenced statement.** Maximum coil pressure drop is 0.10" static pressure.
- 17.8. **Indoor Section:** The indoor coil shall be constructed of aluminum plate fins mechanically bonded to seamless copper tubes. Direct driven indoor blowers shall be ECM type. The indoor motor shall be equipped with a thermal protector. The condensate drain pan shall be sloped to drain as required by the indoor air quality standards.
- 17.9. **Control Circuit:** The internal control circuit shall consist of a current limiting type transformer to generate 24 VAC, switching devices to operate the compressor, indoor fan motor and electrical heater. The internal fan shall have a fan speed controller to adjust the air volume delivered to the space. The control circuit shall incorporate a manual reset safety circuit to render the refrigerant system (compressor and outdoor fan motor) inoperative should there be a loss of airflow or refrigerant. The safety circuit shall be resettable at the wall thermostat. A "Fault" light located on the wall thermostat shall indicate a safety lock-out. The defrost circuit shall consist of a single device and shall be time and temperature initiated. A 90 minute timer, readily adjustable to 30 to 45 minutes, shall initiate a defrost cycle only of the outdoor coil temperature indicated the possibility of an iced condition. The device shall terminate the defrost cycle when the coil temperature has been elevated to a satisfactory level that assures all ice has been removed, or at the end of ten minutes of defrost operation. To prevent rapid compressor cycling and to delay start-up of compressor on a call for cooling, an automatic resetting adjustable time delay circuit shall be also factory installed. In order to prevent the electric heat from being energized until the outdoor temperature is below a desired set point an adjustable outdoor thermostat shall be factory installed.

- 17.10. Motorized Damper Assembly:** A motorized outside air damper shall be provided to supply up to 35% outside air. Barometric relief damper shall be provided by the unit manufacturer.
- 17.11. Demand Ventilation:** Units shall be provided with factory furnished and installed demand ventilation controls via a wall mounted carbon dioxide (CO<sub>2</sub>) sensor. Factory mounted controls shall modulate the motorized outside air damper to maintain a maximum of 800 PPM (adj.) CO<sub>2</sub> concentration in the return air stream. Upon a rise in CO<sub>2</sub> concentration set point, the motorized outside air damper shall modulate open to its scheduled outside air requirement. Upon satisfaction of the CO<sub>2</sub> set point, the motorized damper shall return to the required position to provide a continuous minimum outside air stream as scheduled. Upon unit shutdown or during unoccupied setting, the outside air damper shall close.
- 17.12. Grilles:** The unit manufacturer shall provide aluminum adjustable supply grille and a hinged return air filter grille with a filter frame and 1" thick pleated filters. All filters shall be common industry standard size filters that are readily available and do not have to be fabricated. Cutting and taping of filter segments to make a proper filter is prohibited. The hinged grille shall be provided with thumbscrews and pivot downward. Grille shall be equal to Reliable Model GHDF.
- 17.13. Power Supply:** Units shall be factory wired for a single power connection and shall include factory fusing and disconnect switch in compliance with NEC and U.L... Units shall be provided with phase protection when available.
- 17.14. Thermostat and Guard:** Manufacturer shall provide MAR 7000 or Bard THOC complete stat. It shall be 7-day programmable, "intelligent", self programming, thermostat with occupancy sensor, temperature/humidity/CO<sub>2</sub> sensor with Ethernet connection. Also, provide dehumidification controls as specified hereinbefore. Dehumidification controls sequence shall be via factory installed software. Minimum reheat capacity of the hot gas reheat coil shall be 10°F. Provide hinged metal guard with rounded corners, lock and key for each thermostat.
- 17.15. Warranty:** General warranties are specified in Section "General Mechanical Provisions". The Contractor shall provide a non-prorated, total of five year parts and labor, Manufacturer's warranty on outdoor unit compressor(s). The manufacturer's warranty shall provide for the repair and/or replacement of the compressor(s) that become inoperative because of defects in material or workmanship. The warranty period shall begin on the same date as final acceptance of the installation and shall continue for the full product warranty period specified above. The warranty shall include refrigerant and all other costs associated with the compressor(s) shipment to the Contractor or Facility, compressor(s) replacement, installation and returning the unit to its proper operating condition. The Contractor shall respond within 24 hours upon notification that a compressor has failed under the terms of the warranty. "Respond" shall mean having a Manufacturer certified technician on site to evaluate the extent of the needed repairs and ordering of all items required for repair.

Additionally, a 5-year entire unit parts and labor warranty shall be provided for each unit from unit Manufacturer.

## **PART 18. AUTOMATIC CONTROLS**

- 18.1. General:** Furnish and install a complete system of automatic temperature controls, as specified herein, as shown on the Drawings and as required for a complete installation. All temperature control equipment shall be of the electric type.
- 18.2. Submittals:** The temperature control contractor shall submit 5 copies of complete temperature control diagrams with written "sequence of operation" and factory-printed specification data sheets covering each control device proposed to be used for Engineer's approval prior to installation of any equipment or part of system. Submittal data shall include a schedule of all devices to be installed.
- 18.3. Identification:** Provide permanent nameplates for all control components and for all motor starters. Nameplates shall be engraved laminated plastic with letters sufficiently large to be legible under normal operating conditions. Refer to Section 15010, Identification for additional requirements, nameplate materials, etc.
- 18.4. Conduit, Controls Wiring and Instrumentation Cable:** The HVAC Controls Contractor shall be responsible for the furnishing and installation of a complete and fully functional system as specified, shown on the plans and as required to accomplish the specified sequences of operation.

All control cables and wiring shall be in rigid conduit (no "whips") except conduit is not required above lift-out (lay-in) ceilings. Rigid control conduit is specified in the Electrical Division of the specifications and/or shown on electrical drawings. Minimum HVAC Controls conduit size shall be 3/4" in size. All control conduit, power wiring, relays, contactors and incidental wiring required for a complete and completely functional system as specified, shown on the plans, or as required to accomplish the specified sequences of operation, which is not shown or specified by the Electrical Division, shall be furnished and installed by the HVAC Controls Contractor. This shall include all interlock control wiring between the various components of the air conditioning system and all smoke detection system electrical wiring. Electrical work performed under this Section shall conform to requirements set forth in the Electrical Division of the specifications. All wiring shall be in accordance with the National Electrical Code, and all State and local codes. Coordinate all requirements with the Electrical Sub-Contractor prior to bid and provide all as required.

All wiring, cabling, etc., shall be plenum rated and rated for use at temperatures expected in the location of mounting. Instrumentation cable shall be minimum 18 AWG stranded copper, single or multiple twisted, minimum 2 inch lay of twist, 100 percent shielded pairs and shall have a 300 volt insulation. Each pair shall have a minimum 20 AWG tinned copper drain wire and individual overall pair insulation. Cables shall have an overall aluminum polyester or tinned copper cable shield tape, overall 20 AWG tinned copper cable drain wire and overall cable insulation. Instrumentation cable shall be minimum AWG as specified or heavier AWG as recommended by the controls system manufacturer.

Provide independent, minimum 1", aluminum or rust resistant coated steel J-hook supports for all wiring not in conduit. Wiring supports shall be attached to the building structural system (not other trades' supports, piping, duct, ceiling suspension system, etc). Wiring, cabling, etc., shall be neatly bundled together and supported at no more than six (6) feet on center.

All thermostat and humidistat boxes shall be mounted 46" A.F.F. to the center of the box (ADA height). Where wall mounted CO2 Sensors are indicated, they shall be mounted 58" A.F.F to the center of the box.

- 18.5. Carbon Dioxide Sensors:** Shall be of the non-dispersive infrared type (NDIR) diffusion sampling, repeatable to +/- 8 PPM with a measurement range 0 – 2000 PPM or 0-5000 PPM and be user adjustable. It shall have the following accuracy; from 0-1500 PPM +/- 75 PPM; +/- 5% with an operating range of 32 degrees F to 130 degrees F with a response time of less than 90 seconds.

All wall mounted sensors shall be provided with locking, hinged metal guards. Sensors shall be Veris Industries Series CX or approved equivalent by Johnson Controls or Honeywell.

- 18.6. Humidistats:** Heavy duty industrial type. Provide metal guard as specified for thermostats. All humidistat boxes shall be mounted 46" A.F.F. to the center of the box (ADA height). All humidistat/sensor boxes in walls or partitions shall be sealed/caulked to prevent the passage of air and smoke thru the device.

- 18.7. Smoke Detectors:** Smoke detectors operating on the ionization principles shall be furnished by the Electrical Contractor and installed as indicated on the plans by the Mechanical Subcontractor. Wire the detectors to stop the unit upon smoke detection. Provide required relays, wiring, etc. Coordinate requirements with Electrical Subcontractor prior to bid

- 18.8. Motorized Dampers:** Equal to Ruskin Series CD-40 with heavy duty Belimo actuator. Provide weatherproof construction for outdoor installation.

- 18.9. Space Thermostats:** Space thermostats shall be 7-day microprocessor programmable, low voltage with "Summer-Winter" and fan On-Off-Auto switches sub-base. Coordinate thermostat options and provide as required to accomplish specified sequence of operation. Each thermostat shall have building power supply with transformer and battery back-up power. Provide hinged metal guard with rounded corners, lock and key for each thermostat. All thermostat and humidistat boxes shall be mounted 46" A.F.F. to the center of the box (ADA height). Where wall mounted CO2 sensors are indicated, CO2 Sensors shall be mounted 58" A.F.F to the center of the box. All thermostat/sensor boxes in walls or partitions shall be sealed/caulked to prevent the passage of air and smoke thru the device.

- 18.10. Typical Split System or Wall Mounted Packaged Heat Pump Unit Sequence of Operation:** The control circuit for each unit will be energized by its respective 7-day programmable thermostat. On outdoor unit start-up, the outside air damper shall open to its minimum scheduled outside air setpoint. On outdoor unit shutdown, the motorized outside air damper shall close. During the unoccupied schedule, the outside air damper shall remain closed upon unit start-up. Unit manufacturer furnished thermostat will be used to control heating and cooling. Provide hinged metal guard with rounded corners, lock and key for each thermostat. Provide all required smoke detector interlocks including relays and wiring.

Provide for each heat pump unit an adjustable outdoor thermostat and wire to control second stage of auxiliary electric resistance heater.

Provide a space humidistat to override the cooling thermostat to provide for dehumidification. During dehumidification, the heat pump unit reversing valve shall be locked out to prevent switching to the heating mode. The space thermostat shall then modulate the refrigerant hot gas reheat coil valve (wall mounted packaged heat pump units) or energize the auxiliary heater (HP-A) as required to maintain space temperature. Furnish for approval detailed wiring diagram and sequence of operation.

- 18.11. **Exhaust Fan Controls:** Provide interlocks for certain fans as noted on fan schedule.
- 18.12. **Motorized Dampers:** Equal to Ruskin Series CD-40 with heavy duty Belimo activator. Damper motor/actuators shall be located outside of the air stream.
- 18.13. **Miscellaneous Control:** Provide other miscellaneous controls as required for a complete functional control system.
- 18.14. **Service and Guarantee:** After completion of the installation, adjust all control equipment and place the complete system in operation subject to the approval of the Engineer. Guarantee the control system to be free of defects and adequate to provide required control functions for a period of one year after acceptance of project. Provide free service and maintenance during the guarantee period.

**END OF SECTION**

# ELECTRICAL SPECIFICATIONS





**SECTION 16100**  
**ELECTRICAL**

**PART 1 - GENERAL**

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**1.01. RELATED DOCUMENTS:**

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

**1.02. QUALIFICATIONS OF ELECTRICAL CONTRACTORS:**

- A. Electrical contractor must be properly established as an electrical contractor by the State of Alabama. Electrical contractor shall have had previous experience in the satisfactory installation of at least three systems of this type and size in the State of Alabama.

**1.03. CODES, PERMITS AND INSPECTIONS:**

- A. Comply with applicable laws of the community, with latest edition of National Electrical Code (NEC), NFC 70, and the International Building Code (IBCC) or the edition adopted by the local authority having jurisdiction, where not in conflict with those laws, and with the service rules of the local utility company.
- B. Obtain and pay for all permits and deposits, and arrange for inspections as required.
- C. After completion of the work, submit certificate of final inspection and approval from the local electrical inspector, certifying that the installation complies with all regulations governing same.

**1.04. MATERIALS:**

- A. All materials shall be new, and UL approved where a standard has been established.
- B. Manufacturers' names and model numbers shown on the plans and in the specifications are given to indicate the type and general quality of items to be provided. Equal products by other manufacturers will be accepted.
- C. Material substitutions will be considered only when evidence of equality and suitability, satisfactory to the Architect/Engineer has been presented in writing, with samples if requested by the Architect/Engineer. All prior approvals must have the approval of the engineer of record at the offices of Gunn and Associates, P.C. located at 3102 Highway 14, Millbrook, AL 36054, Phone: 334-285-1273, Fax: 334-285-1274
- D. All proposed substitutions shall be approved in writing at least ten (10) days prior to the bid date.
- E. It shall be understood that the Architect/Engineer has the authority to reject any material or equipment used which is not specified or approved, or showing defects of manufacture or workmanship, before or after such material or equipment is installed.

**1.05. WORKMANSHIP:**

- A. Execute all work so as to present a neat and workmanlike appearance when completed.

**1.06. DESCRIPTION OF WORK:**

- A. Furnish all labor and materials required to complete the electrical work indicated on the drawings or herein specified. Major work included in Section 16 shall be:
- B. Arrange with the local utility companies for providing such electrical services as indicated on drawings or herein specified. Any charges for electrical service to the facility by the utility company shall be included in the contractor's bid price.
- C. Remove or relocate all electrical or electronic services located on or crossing through the project property, either above or below grade, which would obstruct the construction of the project or conflict in any manner with the complete project or any code pertaining thereto.

- D. Furnish and install a complete electrical light and power system including but not limited to the connection of all meters, panelboards, circuit breakers, power outlets, convenience outlets, lighting fixtures, switches, and/or other equipment forming part of the electrical system.
- E. Furnish and install a complete system of outlet boxes, face plates, conduit raceways, backboard, and service entrance conduit for the communications system.
- F. Furnish and install a complete system of outlet boxes, face plates, conduit raceways, Category 6 cables, backboards, patch panels, and fiber optic cables and patch panels for the Data System.
- G. Connect all electrical equipment whether furnished by this contractor or by others.
- H. Furnish and install all disconnect switches not included as an integral part of equipment.
- I. Furnish and install a complete Lighting Control System.
- J. Furnish and install a complete Fire Alarm System compliant with applicable provisions of the International Building Code (IBC) and the National Fire Protection Association (NFPA) Standard No. 72.
- K. Furnish and install a complete Intercom System.
- L. Complete the alterations, additions, and renovations to the electrical system in the existing building as specified herein or as shown on the drawings.
- M. Procure and pay for permits and certifications as required by local and state ordinances and Fire Underwriters certificate of inspection.
- N. Visit the site and determine conditions that affect this contract. Failure to do so will in no way relieve the Contractor of his responsibility under his contract.
- O. Submit to the Architect a certificate of final inspection from local and/or state inspection authorities.
- P. Establish and maintain temporary electrical services for construction purposes.

#### **1.07. DRAWINGS AND SPECIFICATIONS:**

- A. This Contractor shall examine drawings and Specifications relating to the work of all trades and become fully informed as to the extent and character of work required and its relation to all other work in the project prior to submission of bid and prior to the start of any construction.
- B. Drawings and Specifications shall be considered as complementary each to the other. What is called for by one shall be as binding as if called for by both. Where conflicts occur, secure clarification from the Architect in advance of bidding; otherwise incorporate the more stringent conditions into the bid price.
- C. Omissions from the drawings and specifications or the mis-description of details of work which are evidently necessary to carry out the intent of the drawings and specifications, or which are customarily performed, shall not relieve the Contractor from performing such omissions and details of work; they shall be performed as if fully and correctly set forth and described in the drawings and specifications
- D. The drawings indicate diagrammatically the extent, general character, and the approximate location of the work to be performed. In the interest of clearness, the work is not always shown to scale or exact location. Check all measurements, locations of conduit, fixtures, outlets, and equipment with the detailed architectural, structural, and mechanical drawings, and lay out work so as to fit in with ceiling grids, ductwork, sprinkler piping and heads, and other parts. Take finished dimensions at the job site in preference to using scale dimensions.
- E. Where the work is indicated but with minor details omitted, furnish and install the work complete so as to perform its intended functions.
- F. Where doubt arises as to the meaning of the plans and specifications, obtain the Architect's decision before proceeding with parts affected; otherwise assume liability for damage to other work and for making necessary corrections to work in question.
- G. Except as noted above, make no changes in or deviations from the work as shown or specified except on written order of the Architect.

**1.08. EXISTING CONDITIONS:**

- A. Before submitting a bid, visit the site and ascertain all existing conditions.
- B. Make such adjustments in work as are required by the actual conditions encountered.
- C. No consideration will be given after bid opening for alleged misunderstandings regarding utility connections, integration of work with existing system, or other existing conditions.

**1.09. SUBMITTALS:**

- A. Follow procedure outlined in Division 1.
- B. Submittals shall be bound together and shall include a coversheet indicating the following:
  - 1. Project name
  - 2. Trade contractor's name
  - 3. Supplier's name
  - 4. Name and phone number of supplier's contact person
  - 5. A list of each item submitted with manufacturers' names and model numbers.
- C. Within 20 days of award of contract and prior to beginning any work on the project submit six (6) copies of manufacturer's drawings/data sheets for the following items to the Engineer for review:
  - 1. Conductors
  - 2. Cable Pulling tensions. Provide cable pull tension calculations (lateral and longitudinal) on all underground cable runs over 150 feet for cables sized #1 and larger. Provide one line diagram indicating pulling tensions on each run and number and size of each pull box along anticipated route. Calculations shall include changes in direction or elevation of feeder runs.
  - 3. Wiring Devices
  - 4. Conduit Wrapping Tape
  - 5. Switchboards
  - 6. Panelboards
  - 7. Power system breaker coordination. Submit proper breaker settings recommendations with breaker coordination study.
  - 8. Contractor shall coordinate with mechanical/plumbing shop drawings prior to submitting power package to engineer. Adjust overcurrent devices accordingly.
  - 9. Disconnect Switches
  - 10. Fire Stopping
  - 11. Lighting Control System.
  - 12. Lighting Fixtures (include photometric data for each fixture)
  - 13. Fixture Support Equipment
  - 14. Lighting Standards (Poles)
  - 15. Data/Telecommunications System
    - a. Cable
    - b. Equipment
    - c. Installer qualifications
    - d. Makes and Model Numbers of Testing Equipment to be used.
  - 16. Secondary Surge Arresters
  - 17. Transient Voltage Surge Suppressors(Surge Protective Devices)
  - 18. **Fire Alarm System: The fire alarm shop drawings shall bear the approval of the fire protection provider to insure all supervisory valves and flow switches are being monitored by the fire alarm system. Coordinate with fire protection provider prior to bid and provide monitoring for all supervisory valves and flow switches for entire building. Bid accordingly. Include conduit and cable layout, battery calculations, terminal to terminal wiring showing color code and wire numbers, and complete technical data on each system component. Additionally, the contractor or his/her fire alarm system vendor shall provide audibility calculations indicating compliance with all applicable provisions of NFPA 72 and the IBC. The contract drawings indicate a minimum design required to comply with applicable codes. However, since devices vary from manufacturer to manufacturer the contractor shall be**

**responsible for furnishing any/all additional devices as required to provide audibility and visibility levels that comply with applicable sections of NFPA 72 and IBC. Furnish the Owner one set of as built drawings at completion of the project. Provide a copy of the fire alarm contractor's State Fire Marshal's Permit with the submittals for approval.**

- 19. Intercom System
- 20. J-Hooks

- D. Submit samples upon request.
- E. The Contractor is responsible for verifying all quantities and for verifying and coordinating dimensional data with the available space for items other than the basis of design.
- F. Provide a  $\frac{1}{2}" = 1' - 0"$  scale drawing of all electrical rooms containing more than a single panelboard section or containing a panelboard and other electrical and/or mechanical equipment. These drawings shall be submitted along with equipment data sheets.
- G. The contractor shall review and approve, or make appropriate notations on each item prior to submittal to the architect. Submittals without contractor's approval will be rejected.

**1.10. COORDINATION OF SERVICE WITH OTHER TRADES:**

- A. It shall be the responsibility of the Electrical Contractor to coordinate the electrical service characteristics to each piece of electrically operated equipment with all trades providing electrically operated equipment.
- B. Within ten (10) working days of notification to proceed with construction from the Architect, the Electrical Contractor shall notify, in writing, all trades providing electrically operated equipment the characteristic of the electrical power being supplied to each piece of electrically operated equipment.
- C. A copy of this notification shall be provided to the General Contractor and the Architect.
- D. Be informed as to equipment being furnished by other trades, but not liable for added cost incurred by equipment substitutions made by others which require excess electrical wiring or equipment above that indicated on drawings or specified.
- E. The contractor providing the equipment shall be responsible for the additional costs.

**1.11. PROGRESS OF WORK:**

- A. Schedule work as necessary to cooperate with other trades, Do not delay other trades. Maintain necessary competent mechanics and supervision to provide an orderly progression of the work.

**1.12. PROTECTION OF PERSONS AND PROPERTY DURING CONSTRUCTION:**

- A. Take all precautions necessary to provide safety and protection to persons and the protection of materials and property.
- B. Protect items of equipment from stains, corrosion, scratches, and any other damage or dirt, whether in storage, at job site or installed. No damaged or dirty equipment, lenses, or reflectors will be accepted.
- C. Live panelboards, outlets, switches, motor control equipment, junction boxes, etc., shall be protected against contact of live parts and conductors by personnel.

**1.13. CLEANING UP:**

- A. During the progress of work, keep the Owner's premises in a neat and orderly condition, free from accumulation of debris resulting from this work. At the completion of the work, remove all material, scrap, etc. not a part of this Contract.

**1.14. AS-BUILT DRAWINGS, AND OPERATING AND MAINTENANCE INSTRUCTIONS:**

- A. Prior to the Final Acceptance Inspection the Contractor shall turn over to the Architect one set of reproducible "as built" drawings, including corrected fire alarm system shop drawings, three (3) sets of all equipment catalogs and maintenance data, manufacturers' warranties, and three (3) sets of shop drawings on all equipment.

**1.15. TESTING:**

- A. Upon completion of the work, conduct a thorough test in the presence of Architect or his representative, and demonstrate that all systems are in perfect working condition.

**1.16. INSPECTIONS:**

- A. The contractor shall have all systems ready for operation and an electrician available to remove panel fronts, coverplates, fixture doors, etc., at the final inspection and any other scheduled inspections.
- B. It is the contractor's responsibility to have the job ready for inspections when they are scheduled. We will perform inspections as required by our contract. If project is not ready during inspection and requires a re-inspection by Gunn & Associates, then the contractor shall pay Gunn & Associates, P.C. for the re-inspection. The payment shall be made directly to Gunn & Associates, P.C. in the amount to be determined by engineer. Not to exceed \$1,500 for single re-inspection fee. Payment must be received by Gunn & Associates prior to scheduling re-inspection.

**1.17. DEMONSTRATION:**

- A. By on-off, stop-start operation, demonstrate to the Owner or his representative, the use, working, resetting, and adjusting of each and every system. Submit statement initialed by the Owner that such demonstration has been made.

**1.18. WARRANTY:**

- A. Warrant the entire electrical system in proper working order. Replace, without additional charge, all work or material that may develop defects (ordinary wear and tear or damage resulting from improper handling excepted) within a period of one year from date of final to general contractor. Provide the owner with two bound copies of all manufacturers' warranties.
- B. Data and Telecommunications system cabling shall be warranted for a minimum of 15 years.

**1.19. TEMPORARY SYSTEMS:**

- A. The Electrical Contractor shall be responsible for furnishing and installing equipment and materials necessary for providing electrical power and lighting where needed for the construction of the project.
- B. Electrical Contractor will be responsible for paying for and providing temporary construction power and lighting for entire job site. Coordinate with local jurisdictions and utility companies and pay all fees necessary to get temporary power to the job site. General Contractor shall be responsible for all monthly utility cost for duration of project or date of substantial completion.

**1.20. SERVICE INTERRUPTION CLEARANCE WITH OWNER:**

- A. Before submitting a proposal, check with the Owner concerning interruption of service to the existing electrical systems. No interruption shall be made except at such time and for such duration as approved by the Owner. The Contractor's bid shall include all necessary over-time and weekend work.

**1.21. DEFINITIONS:**

"AWG" - American Wire Gauge

"ADA" - Americans with Disabilities Act

"As required" - Any and all items required to complete the installation of an item so as to perform its intended function.

"Circuiting" - Conductors, raceways, raceway fittings, and associated hardware.

"EMT" - Electrical Metallic Tubing, "thin wall"

"IBC" - International Building Code

"Install" - furnish, install, and make all necessary connections to and/or for the item(s) indicated or specified.

"NEC" - National Electrical Code, ANSI/NFPA 70, latest edition or the edition adopted by the authority having jurisdiction.

"Necessary" - Any and all items required to complete the installation of an item so as to perform its intended function.

"NEMA" - National Electrical Manufacturers' Association

"NFPA" - National Fire Protection Association  
"PVC Conduit" – Rigid Nonmetallic Polyvinyl Chloride conduit  
"RGS Conduit" – Rigid galvanized steel conduit  
"UL" - Underwriters' Laboratories, Inc.

## **PART 2 - MATERIALS**

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### **2.01. GENERAL:**

- A. This section includes all basic materials for raceways, fittings, busways, conductors, panelboards, switchboards, lighting fixtures and accessories, etc., as required for a complete installation.
- B. All materials shall be new and listed by the Underwriters Laboratories. Material substitutions will be considered only when evidence of equality and suitability, satisfactory to the Architect has been presented in writing, with samples if requested by the Architect.
- C. It shall be understood that the Architect/Engineer has the authority to reject any material or equipment used which is not specified or approved, or showing defects of manufacture or workmanship, before or after such material or equipment is installed.

### **2.02. CONDUITS:**

- A. Rigid Metal (Galvanized Steel-RGS) Conduit: Rigid metal conduit shall be mild steel piping, galvanized inside and outside, and conform to ASA Specification 080.1 and Underwriters' Laboratories Specifications. By Sprang, Republic, Wheatland, Triangle or Pittsburgh.
- B. Conduit systems are subject to system color identification the complete length for the conduit system for the system they contain and as identified by these specifications:
  - a. Silver Conduit Systems (no tint) - 240 volt System & less. Standard silver conduit system will be utilized for all power systems rated at 240 volts and less.
  - b. Red Conduit Systems – Fire Alarm & Life Safety systems. Red conduit systems will be utilized for all life safety, fire alarm systems & as directed by design documents.
- C. Intermediate Metal Conduit (IMC): IMC shall be hot dipped galvanized inside and outside and manufactured in accordance with U.L. Standard #6 or #1242. By Allied or approved equal.
- D. Electrical Metallic Tubing (EMT): EMT shall be high grade steel electro-galvanized outside and lacquer or enamel coating inside and conform to ASA Specifications 080.1 and Underwriters' Laboratories Specifications. By Sprang, Republic, Wheatland, Triangle or Pittsburgh.
- E. Rigid Nonmetallic Conduit (PVC): PVC conduit where exposed shall be high impact Schedule 80; below ground and below or in slab PVC shall be of high impact Schedule 40 PVC and shall conform to Underwriters' Laboratories Standard UL-651. By Carlon, Kraley Pittsburgh, R.G. Sloan or Southwestern.
- F. Rigid Aluminum: Rigid Aluminum conduit shall be manufactured from 6063, t-1 aluminum alloy and shall meet the requirements of Federal Spec. WW-C-540c and ANSI C80.5 and shall be U.L. listed in accordance with UL-6. Equal to products by V.A.W. of America.

### **2.03. COUPLINGS, FITTINGS, AND CONNECTORS:**

- A. RGS & IMC: By Appleton, Crouse-Hinds, Efcor, O-Z/Gedney, Raco, or Republic.
- B. EMT: EMT fittings shall be all steel type setscrew or insulated throat compression type. Pressure indented or slip fit type will not be accepted. All connectors to be insulated. By Appleton, Efcor, Raco Steel City, or Thomas & Betts.
- C. PVC: PVC fittings shall be of high impact PVC Schedule 40 or Schedule 80 to match the installed conduit. Joints shall be made with PVC solvent cement as recommended by manufacturer. By Pittsburgh, R.G. Sloan or Carlon.
- D. Rigid Aluminum: Fittings used with Rigid Aluminum conduit shall be formed of the same alloy as the conduit or shall be copper free cast aluminum unless specifically indicated otherwise.

### **2.04. CONDUIT BODIES:**

- A. Conduit bodies shall be malleable iron except in kitchen, dishwashing, and waste water treatment areas conduit bodies shall be copper free cast aluminum with stamped aluminum covers.
- B. Covers shall be screw retained with wedge nut or threaded body. Covers on bodies installed outdoors shall be approved and rated for installation outdoors.
- C. Bodies shall comply with NEC 370 and 373.
- D. RGS & IMC: By Appleton, Crouse-Hinds, Efcor, O-Z/Gedney, Raco, or Republic.
- E. Conduit cannot be used as ground. Provide separate insulated green grounding wire.

#### **2.05. BUSHINGS:**

- A. Bushings up to and including 1" shall have a tapered throat.
- B. Bushings 1-1/4" and larger shall be the insulating type.
- C. Grounding bushings shall be specification grade insulated grounding type bushings with tin plated copper grounding saddles and shall be equal to O-Z/Gedney Type BLG or HBLG.
- D. Bushings shall be zinc plated malleable iron or copper free cast aluminum.
- E. Bushings for terminating Data, Telecommunications, control, CATV, and similar conduits above ceilings and at backboards may be PVC or Polyethylene insulating bushings equal to those manufactured by Arlington Industries and Bridgeport Fittings.

#### **2.06. EXPANSION FITTINGS:**

- A. Conduit Expansion Joints shall be UL Listed.
- B. Expansion joints in rigid metal conduits shall consist of a threaded malleable iron body, pressure bushing, watertight packing, pressure ring, gasket, insulating bushing, and external grounding jumper, and shall be equal to O-Z Gedney Type AX with Type BJ bonding jumper.
- C. Expansion joints for EMT conduit shall be same as above with additional EMT couplings and connectors, and shall be equal to O-Z Gedney Type TX with Type BJ bonding jumper.
- D. Expansion joints in PVC conduit shall be equal to Carlon Series E945.
- E. Expansion joints shall provide a minimum of 4" of conduit movement.

#### **2.07. BELOW GRADE THRU WALL WATER SEALS:**

- A. Thru wall water seals for conduits penetrating exterior below grade concrete walls shall be seal systems by O-Z/Gedney or The Metraflex Company.
- B. Thru wall water seals for conduits penetrating exterior below grade concrete walls shall be Metraseal thru wall water seals by The Metraflex Company.

#### **2.08. CONDUIT ACCESSORIES:**

- A. Conduit clamps and supports for metallic conduit shall be galvanized steel by Efcor, Steel City, or Mineralac. Conduit fittings by Appleton, Crouse-Hinds, O-Z/Gedney, Pyle-National or approved equal.
- B. Conduit clamps and supports for nonmetallic conduit shall be nonmetallic high impact PVC by Carlon, Pittsburg, or Sloan.
- C. Conduit clamps for aluminum conduits shall be stainless steel or cast copper free aluminum with stainless steel fasteners.

#### **2.09. FLEXIBLE CONDUIT:**

- A. Liquidtight flexible metal conduit:
  - 1. Neoprene-jacketed liquidtight flexible metal conduit.
  - 2. Equal to Anaconda Sealtite.

#### **2.10. ELECTRICAL TAPES:**

- A. General use electrical tape shall be 8 mil (.008") thick, minimum, premium grade, pressure sensitive, flame retardant, vinyl electrical tape meeting UL 510, ASTM-D-3005, and MIL-I-24391C. The tape shall be equal to 3M No. 88 or Plymouth Premium 85 CW.

- B. Rubber tape used as primary tape shall be a 30 mil (.030") thick, minimum self-amalgamating, low voltage rubber tape rated for use through 600 V. Rubber tape shall be equal to 3M No. 2150 or Plymouth 122 Rubber Tape.
- C. Electrical filler tape shall be a 125 mil (.125") thick, minimum, self-amalgamating, low voltage insulating compound rated for use through 5 kV. Filler tape shall be equal to 3M SCOTCHFILL or Plymouth 125 Electrical Filler Tape.

**2.11. PIPE WRAPPING TAPE:**

- A. Pipe wrapping tape shall be a 10 mil (.010") thick, minimum, pressure sensitive, vinyl tape manufactured for pipe wrapping applications.
- B. The tape shall be UV, bacteria, and fungus resistant.
- C. The manufacturer's name and tape type shall be printed on the back of the tape.
- D. Pipe wrapping tape shall be equal to Plymouth Rubber Co. PLYWRAP 11, or 3M No. 50.

**2.12. WIRE NUTS:**

- A. Wire nuts for conductor splicing shall be winged type connectors with a square, plated steel spring and flame retardant thermoplastic shell.
- B. The connector shall be rated for the number and size conductors being connected.
- C. The Wire Nuts shall be rated for 105°C. And UL 486C listed.
- D. Wire nuts shall be equal to connectors by Ideal/Buchanan, 3M/Scotch, or T & B,

**2.13. SPLIT BOLT CONNECTORS:**

- A. Split bolt connectors for splicing conductors shall be UL 486A listed, shall be tin plated copper, and shall have a hexagonal head and nut.
- B. Split bolt connectors for conductors size AWG #4 and larger shall have a serrated spacer bar between conductors.
- C. Split bolt connectors for splicing conductors AWG #12 through #6 shall be equal to IlSCO Type SEL and Type SK for AWG #4 and larger conductors.

**2.14. MULTI-TAP CONNECTORS:**

- A. Multi-tap connectors shall be insulated type
- B. Multi-tap connectors shall be rated for the conductor sizes indicated on the drawings.
- C. The connectors shall be provided for the number of conductors indicated, including any future taps shown, plus a minimum of one additional tap.
- D. Multi-tap connectors shall be equal to IlSCO Type PCT or Type PED-CP.

**2.15. WATERPROOF WIRE JOINTS:**

- A. Splices made below grade shall be made connectors, UL listed as waterproof, for below grade applications.
- B. Waterproof Twist On Connectors for Up to #6 W/1#12 tap Conductors: Single piece wire nut pre-filled with silicone sealant. Sealant shall be rated for 45-400 degrees F. Connectors shall have same insulation rating as conductors. Sizes shall be available for connecting up to 2 #6 w/1#12 tap conductors. Connectors shall be UL listed as waterproof for below grade applications and equal to Ideal Buchanan B-Cap Twist and Seal Wire Connectors, King Safety Products, Tyco/Raychem GelCap SL, or equal.
- C. Waterproof Stub Splice Kit for up to #2/0 Conductors: Kit containing connector block, outer waterproof sleeve, and lubricant. Sleeve shall have same insulation rating as conductors. Kit shall be rated for feeder wire sizes #14 through #2/0 and tap wire sizes of #14 through #6. Connectors shall be UL listed as waterproof for below grade applications and equal to Tyco/Raychem GelCap SL.
- D. Waterproof In-line Splice Kit for up to #2/0 Conductors: Kit containing connector block, outer waterproof sleeve, and lubricant. Sleeve shall have same insulation rating as conductors. Kit



shall be rated for wire sizes #6 through #350 kcm. Connectors shall be equal to Tyco/Raychem GTAP.

- E. Waterproof Splice Kit for Conductors above #2/0: Kit containing connector block, outer waterproof sleeve, and lubricant. Sleeve shall have same insulation rating as conductors. Kit shall be rated for wire sizes #14 through #2/0. Connectors shall be equal to Tyco/Raychem GHFC.

**2.16. PLASTIC MARKING TAPE FOR MARKING UNDERGROUND CABLES AND CONDUITS:**

- A. Plastic marking tape shall be acid and alkali-resistant polyethylene film, 6 inches wide with minimum thickness of 0.004 inch.
- B. Tape shall have a minimum strength of 1750 psi lengthwise and 1500 psi crosswise.
- C. The tape shall be manufactured with integral wires, foil backing or other means to enable detection by a metal detector when the tape is buried up to 3 feet deep.
- D. The tape shall be of a type specifically manufactured for marking and locating underground utilities.
- E. The metallic core of the tape shall be encased in a protective jacket or provided with other means to protect it from corrosion.
- F. Tape color shall be as specified in the table below and shall bear a continuous printed inscription describing the specific utility.

Red:	Electric
Orange:	Data, Telephone, Television,

**2.17. FIRE STOPPING:**

- A. Fire sealant shall be intumescent caulk, putty, sheet and/or wrap/strip as required to attain the proper rating.
- B. Caulk shall be equal to 3M CP25 N/S and/or S/L.
- C. Putty shall be equal to 3M Fire Barrier Moldable Putty.
- D. Sheet equal to 3M CS195.
- E. Wrap/strip equal to 3M FS195.
- F. Equal products by Dow Corning, Hilti, and Metacaulk will be accepted.

**2.18. SPACERS FOR CONCRETE ENCASED ELECTRICAL DUCTS:**

- A. Spacers shall be interlocking high impact plastic assemblies, which provide horizontal and vertical spacing, and hold the ducts and re-bar, where applicable, in place.
- B. The spacers shall be equal to Carlon Snap-Lok Spacers.

**2.19. JUNCTION BOXES (THRU 4-11/16"):**

- A. Sheet Metal: To be standard type with knockouts made of hot dipped galvanized steel, By Steel City, Raco, Appleton or approved equal.
- B. Cast: To be type FS, FD, JB, GS or SEH as required for application.

**2.20. JUNCTION AND PULL BOXES (LARGER THAN 4-11/16"):**

- A. Shall be cast metal for all below grade exterior use and where indicated on plans. All other shall be oil tight, JIC boxes not less than 16 gauge, equal to Hoffman type "CH" boxes.

**2.21. PULL BOXES:**

- A. Galvanized sheet metal screw-cover type with UL label as produced by Austin, B & C Metal Stamping Company, E-Box, Hoffman, Wiegmann, or approved equal.

**2.22. JUNCTION AND TERMINAL BOXES FOR AUXILIARY SYSTEMS:**

- A. Junction boxes for auxiliary system circuiting splicing shall be formed of galvanized steel.
- B. Boxes shall have hinged front, locking door(s).
- C. Metal back plates shall be provided for mounting terminal strips or other devices.

- D. Screw terminal strips shall be provided with a minimum of 25 percent spare terminals.
- E. Boxes shall be sized to accommodate the terminal blocks and conductors, providing code required bending space.
- F. Boxes for auxiliary systems shall be manufactured by Austin, E-Box, Hoffman, or Wiegmann.
- G. Provide complete back boxes for all surface mounted devices. Back box shall have knockout on top and bottom as needed. Surface mounted junction boxes with devices mounted to it will not be accepted. Wiremold boxes will be accepted.

**2.23. AUXILIARY GUTTERS (WIRING TROUGHS):**

- A. Gutters shall be of sizes shown and/or required by the NEC (whichever is larger), constructed of code gauge, galvanized sheet steel, painted ANSI 61 gray.
- B. Gutters shall be UL listed and shall be of NEMA 3R construction in wet or damp locations or shall be as indicated on the drawings.
- C. Gutters shall be as produced by Austin, B & C Metal Stamping Company, E-Box, Hoffman, Wiegmann, or approved equal.

**2.24. STRUT SYSTEM FOR SUPPORT OF ELECTRICAL EQUIPMENT:**

- A. Strut shall be 1-5/8" except where heavier strut is required to support the load, for rigidity, or where specifically indicated otherwise.
- B. Cold-formed steel, ASTM A 570 or A 446 GR A.
- C. Stainless Steel Strut: Type 304, ASTM A 240.
- D. Hot Dipped Galvanized Steel Strut: Zinc coated after manufacturing operations are complete, ASTM A 123 or A 153
- E. Electro-galvanized Steel Strut: Electrolytically zinc coated, ASTM B 633 Type III SC 1.
- F. Fittings: Same material as strut, ASTM A 575, A 576, A 36, A 635, or A 240.
- G. Zinc Primer: As recommended by strut manufacturer.
- H. Strut Systems shall be as manufactured by B-Line, Erico, Globe, Kindorf, MasterStrut, Power Strut, T&B SuperStrut, or Unistrut.

**2.25. OUTLET BOXES:**

- A. General: Except as noted, boxes shall be standard hot dipped galvanized steel at least 1-1/2" deep, of metal at least 1/16" thick; sized to accommodate devices and conductors per NEC Article 370; product of Appleton, National, Steel City, or approved equal.
- B. Ceiling and Wall Bracket Outlets: 4" octagonal boxes with plaster rings appropriate for finish surface.
- C. Typical boxes (for switches, receptacles and auxiliary systems):
  - 1. 4" square boxes ganged as required. Box volume shall be in accordance with NEC Section 370 – provide extensions as required.
  - 2. Furnish with 3/4" plaster rings where employed in plaster, 1" tile covers where used in ceramic tile, 1" plaster rings where set in exposed concrete, and otherwise appropriate for surface and construction.
  - 3. Use 4-11/16" square, 2-1/8" deep boxes where more than 10 conductors enter the boxes. Provide extensions as required to provide volume per NEC.
  - 4. Where existing walls are furred out with shallow hatch channel and sheet rock then the contractor will be required to use a shallow junction as required.
  - 5. All exposed junction boxes for receptacles, communications devices, switches, and fire alarm devices shall be provided with back boxes. Do not use standard junction boxes when exposed. No exposed edges of devices plates will be allowed. No knockouts on the side of the box. Boxes shall be similar to Wiremold 500 & 700 Series.
- D. Boxes in Exposed (or Thin-Coat Plastered) Masonry: Where conduit connections permit, employ solid flush-type, square-cornered, masonry boxes with turned-in device holders; otherwise employ typical box with 1-1/2" square-cut tile cover.
- E. Multiple Outlet Floor Boxes:

1. Floor boxes shall be multi-outlet type providing space for four separate services for duplex outlets and/or Data/Telecommunications outlets.
  2. Floor boxes shall be provided with covers equal to Walker S36CCTCAL(BK)(BS) flush access hatch with carpet trim for carpeted floors and S36BBTCAL(BK)(BS) trim for vinyl covered floors.
  3. Floor boxes shall be provided with 20 amp duplex grounding duplex receptacles, isolated ground receptacles, and Data/Telecommunications outlets as indicated on the drawings.
  4. Data outlets shall be modular type capable of housing up to six (6) Cat 5e jacks. Boxes shall be provided with two (2) active jacks unless indicated otherwise on the drawings. Provide with communications bracket(s) equal to Wiremold #RFB4-LPB.
  5. Provide blank plates for all unused openings.
  6. The boxes shall be equal to what is specified on drawings.
- F. Boxes used with Exposed Conduit: 4" square utility boxes.
- G. Exterior Boxes: Galvanized cast-metal boxes, Crouse-Hinds Type FS or FD as appropriate. Make weatherproof with gasketed covers. Equal products by Appleton, Killark, O-Z/Gedney, or approved equal will be accepted.
- H. Exterior Boxes: All receptacle boxes shall be recessed unless specifically called out not to be. This includes exterior receptacles in all masonry type walls including but not limited to Pre-cast, Brick, Block, etc.
- I. Boxes used with Recessed Lighting Fixtures: Provide a 4" square box with blank cover.
- J. Boxes in Dry Wall Construction: Sectional type switch boxes at least 2-1/2" deep may be used instead of typical box (but not where dry wall finish is applied over masonry back-up and not where multi-gang devices occur).
- K. Boxes installed exposed in kitchen and dishwashing areas shall be copper free cast aluminum with gasketed cast coverplates, without lift cover, unless specifically indicated otherwise on the drawings.

## **2.26. CONDUCTORS AND CABLES:**

- A. Power Conductors
1. The ungrounded conductors (phase) and the grounded conductor (neutral) of each voltage system being installed shall be phase identified the full length of the conductor with the color characteristics manufactured in the insulation of cable from the cable manufacturer. Required color cable will then be installed for the specific voltage system as identified in these specifications.
  2. All conductors shall be copper with not less than 98% conductivity and with current carrying capacities per N.E.C. for 60°C. for sizes through #1 AWG and 75°C for conductors #1/0 and above.
  3. All conductors shall have manufacturer's name, type insulation, and conductor size imprinted on jacket at regular intervals.
  4. Conductors of size #10 and smaller shall be solid copper conductors with 600 volt type THHN or THWN insulation.
  5. Conductors of size #8 and larger shall be stranded copper conductors with 600 volt type THHN or THWN insulation.
  6. All motor branch circuits, HVAC, and plumbing equipment shall be stranded copper conductors with 600 volt type RHH-RHW insulation.
  7. All conductors installed in conduit below grade shall be rated for wet location.
  8. Manufacturer: Conductors shall be products of GE, Triangle, Phelps- Dodge, Anaconda, Rome, Habirshaw, General Cable, or approved equal.
  9. Fixture Wire:
    - a. Conductors feeding into fixtures, other than fluorescent fixtures, of 300 watts or less shall be #14, 200°C., type SF-2, for fixtures of more than 300 watts #12, 200°C., type SF-2 shall be used.
    - b. Conductors pulled through fluorescent fixtures shall have Type TFN or TFFN fixture wire, rated 90oC.
    - c. Conductors shall be by Dodge, Anaconda, Rome General Cable or Southwire.

- B. Control and Signal Wire: Conductor type TFF, minimum size #16 copper and fully color-coded, shall be used. Conductors shall be by Anaconda, Houston Wire & Cable, General Cable, Phelps Dodge, Rome, or Southwire.

## **2.27. WIRING DEVICES:**

- A. General: Manufacturer's and catalog numbers listed are used to establish style, type and quality. Unless otherwise indicated on drawings, all wiring devices shall be UL listed, side-wired specification grade.
- B. Manufacturers: Equal devices by Hubbell, Leviton, and P & S will be accepted. All devices shall have plaster ears.
- C. Wall switches: 120/277V, 20A, AC, flush enclosed, quiet type switches with thermoplastic body and polycarbonate toggles. Switches shall meet Federal Specification WS-896. Switches shall be, Hubbell 1200 series, Leviton 1200 series, or P & S PS20AC series single pole, 2-pole, 3-way, or 4-way as required.
- D. Duplex receptacles (general purpose): 125V/20A flush duplex back and side wired hard use specification grade receptacles, NEMA 5-20R configuration, with nylon face and body, grounding terminal and break-off fins for converting to 2-circuit use. Receptacles shall meet Federal Specification WC-596. Color to match wall switches. Equal to P & S 5362, Hubbell CR20, or Leviton 5362.
- E. Tamper Resistant Duplex receptacles,: 125V/20A flush duplex, hospital grade, tamper resistant receptacles, NEMA 5-20R configuration, with nylon face and body, grounding terminal. Receptacles shall meet Federal Specification WC-596. Color to match wall switches. Equal to P & S TR62-H, or Hubbell HBL8300SGDuplex combination 125/250 volt receptacles: receptacles shall be 20 amp, combination 125 volt(NEMA 5-20R)/250 volt(NEMA 6-20R) grounding receptacles.
- F. Ground Fault Circuit Interrupt Receptacles: 125V/20 amp ground fault circuit interrupting receptacle for personnel protection, NEMA 5-20R configuration, Equal to Hubbell #GF5362, Leviton #6599, or P & S 2091. Each GFCI symbol on drawing indicates a GFCI type receptacle. Do not through-wire non-GFCI receptacles from GFCI receptacles where ground fault protection is required. All exterior receptacles shall be ground fault interrupting type with weatherproof coverplates.
- G. Faceless Ground Fault Circuit Interrupter: 125V, 20 amp ground fault circuit interrupter UL listed for personnel protection, equal to Hubbell GFR5350 Series, Leviton 6490, or Pass & Seymour Series 2081.
- H. Single Receptacles: Flush Bakelite receptacles with side wiring and grounding terminal, voltage, amperage, and configuration as required for circuit indicated.
- I. Each single or multi outlet receptacle, other than straight blade, 15 or 20 amp, 120 volts, NEMA 5-15R or NEMA 5-20R, shall be provided with matching cord plugs.
- J. Plugs for kitchen equipment to be plugged into wall mounted straight blade receptacles shall be angled type.
- K. Wiring devices shall be of color as directed by Architect. Devices must be available in ivory, brown, black, white, and gray. Devices connected to the emergency generator shall be red in color.
- L. All projects classified as an elementary school type facility shall be provided with tamper proof type receptacles.
- M. Pin and Sleeve Devices:
  - 1. Pin and Sleeve Devices shall be watertight plugs and receptacles of the ratings shown on the legend and/or schedules.
  - 2. Devices shall be listed to UL Standard 498 and UL Classified to IEC Standards 309-1 and 309-2.
  - 3. Devices shall be furnished as matching plugs and receptacles with cast aluminum angled backbox.
  - 4. Devices shall be manufactured by Hubbell, Leviton, or P&S.

**2.28. DEVICE PLATES:**

- A. Type appropriate for the associated wiring device, equal to Sierra Stainless Steel Smoothline. Device plates shall be of color as directed by Architect. Devices must be available in ivory, brown, black, white, and stainless steel. Provide single plate of proper gang where more than one device occurs (do not gang dimmers with rocker switches).
- B. Damp Location: 20 amp, 125 and 250 volt receptacles - Covers shall be weatherproof when plugs are not installed, provide cast aluminum weatherproof coverplates with single lift cover and gasket equal to Hubbell CWP26H.
- C. Wet Locations, 20 amp, 125 and 250 volt receptacles: Covers shall be weatherproof In-Use covers, rated NEMA 3R when in use and shall be constructed of cast aluminum with sealing gasket. Covers shall be equal to products by Hubbell, Leviton, Steel City, T & B, and Taymac.
- D. Coverplates for exposed cast aluminum boxes in kitchen and dishwashing areas shall be cast coverplates, without lift cover, unless specifically indicated otherwise on the drawings.
- E. Color: Wiring device cover plates shall be of color as indicated on drawings or directed by Architect. Devices must be available in ivory, brown, black, white, gray, and stainless steel.
- F. Jumbo and Mini-Jumbo plates will not be accepted.

**2.29. OCCUPANCY SENSORS AND ACCESSORIES FOR LIGHTING CONTROL:**

- A. Occupancy sensors shall be totally passive in nature, in that the sensors shall not emit or interfere with any other electronic device, or human characteristic. Sensors shall be dual technology, i.e.: Passive Infrared (PIR) and Microphonic.
- B. PIR shall initiate an "on" condition and the PIR or microphones shall maintain the load "on".
- C. Upon detection of human activity by the detector the lights shall come on and a time delay shall be initiated to maintain the lights on for a pre-set time period. The time delay shall be factory set and field adjustable from 30 seconds to 20 minutes.
- D. All devices shall be factory warranted for 5 years.
- E. All sensors shall be low voltage, 12 to 24 volts and shall work in conjunction with remote power packs.
- F. Occupancy sensors shall be as shown on drawings.

**2.30. GROUNDING:**

- A. Ground Rods shall be  $\frac{3}{4}$ " x 10' copperclad steel.
- B. All grounding conductors shall be copper.

**2.31. DATA AND TELECOMMUNICATIONS SYSTEMS:**

- A. Qualifications of Data and Telecommunications Systems Installer:
  - 1. The Cable installer sub-contractor shall be properly licensed and established in the business of data and telecommunications systems installation.
  - 2. Data and Telecommunications Cable Installers shall be certified as installers by BiCSi. Proof of Certification shall be provided prior to beginning installation.
  - 3. Cable installers shall be certified by the cable manufacturer and the connectivity hardware manufacturer and the entire structured cabling system covered by a manufacture/installer 15 year, minimum, warranty. Proof of Certification and Warranty agreement shall be provided prior to beginning installation.
- B. Data and Telecommunications Outlets:
  - 1. Data and Telecommunications outlets shall be modular, Category 6 outlets configured for T568B (AT&T) termination. See drawings for model numbers.
  - 2. Modules shall be mounted in brackets that allow use of standard receptacle faceplates. See drawings for model numbers.
  - 3. The face of modules/jacks shall be flush with the face of the coverplate.
  - 4. Each outlet coverplate shall be capable of housing a minimum of four (4) data/telecommunications jacks.

5. Each Phone/Data outlet shall have a minimum of four (2) RJ45 Category 6 jacks installed, one telephone and one data.
  6. Wall phone outlets for hanging phones shall have a stainless steel coverplate with integral lugs for modular wall hung phone installation complete with jack. Wall phone outlets shall be equal to Hubbell Series 630 plates.
  7. All unused jack ports shall be equipped with matching blank filler.
  8. Architect to select color of faceplate.
- C. Data System Patch Panel:
1. Patch Panel:
    - a. CAT 6 patch panels that fit into rack shown by Panduit, Hubbell, or Ortronics.
  2. Cable Management Panel:
    - a. See drawings for details.
  3. Rack Mounted Fiber Optic Patch Panel:
    - a. See drawings for details.
- D. Data and Telecommunications Racks:
1. Wall Mounted Equipment Rack:
    - a. Wall mounted equipment racks shall be standard as shown on drawings.
    - b. The frames shall be predrilled and tapped with #12-24 threaded EIA hole pattern.
  2. Fiber Optic Wall Mount Patch Cabinets:
    - a. Fiber Optic Cable Wall Mounted Cabinets shall be fully gasketed, powder coat steel cabinets which accept modular adapter panels for up to 12 multimode terminations.
    - b. Adapters shall be Type LC with metal sleeves.
    - c. Provide 6 or 12 adapter blocks as required.
    - d. Cabinets shall be as shown on drawings.
  3. Equal products by Systimax, Ortronics, or Hubbell shall be acceptable.
- E. Telecommunications and Data Cables:
1. Cables shall be warranted for a period of 15 years by the manufacturer and installing contractor.
  2. Telephone and Data Cables:
    - a. Telephone and Data cables shall be as called out on drawings.
    - b. Cable shall be plenum rated where required.
    - c. Cables shall be manufactured by Berk-Tek, Systimax, or Belden.
  3. FiberOptic Cable:
    - a. Fiber Optic Cable shall be as called out on drawings.
    - b. Cables shall be manufactured by Berk-Tek, Systimax, or Belden.
  4. Communications Cables:
    - a. Speaker cable shall be 22 gauge, 4 conductor, aluminum foil shielded cable, with drain wire equal to Belden #5502FE or Comtran #6302.
    - b. 25 pair cable shall be 22 ga. air core, shielded, exchange cable equal to Superior-Essex #01-062-40.
    - c. 25 pair cable shall be 24 ga. air core, shielded, exchange cable equal to Superior-Essex #01-097-40.
    - d. 50 pair cable shall be 22 ga. air core, shielded, exchange cable equal to Superior-Essex #01-065-40.
    - e. 50 pair cable shall be 24 ga. air core, shielded, exchange cable equal to Superior-Essex #01-100-40.
    - f. 100 pair cable shall be 22 ga. air core, shielded, exchange cable equal to Superior-Essex #01-069-40.
    - g. 100 pair cable shall be 24 ga. air core, shielded, exchange cable equal to Superior-Essex #01-104-40.
- F. Warranty: The entire Cat 6 and cabling system shall be warranted in writing by the cable manufacturer and certified contractor for a minimum of 15 years.

## **2.32. LIGHTING FIXTURES**

- A. General:

1. All Lighting Fixtures shall be UL labeled.
  2. Fixtures installed in fire rated ceilings or ceiling assemblies shall be rated for installation in fire rated ceilings.
  3. Furnish fixtures complete with lamps, ballasts and internal wiring factory installed.
  4. Fixtures shall be furnished as specified herein and as shown on the fixture schedule on the plans. Catalog numbers shown are for basic units; furnish all fixtures complete with flexible connections, trim, plaster frames, and all other appurtenances necessary to the installation.
  5. Substitutions: Reference to a specific manufacturer's product is made to establish a standard of quality and design, and to give a general description of the basic type desired. Equal products by the listed manufacturers will be accepted subject to the Engineer's approval.
  6. It shall be the responsibility of the contractor to verify the exact type ceiling, type fixture mounting and trim, and recessing depth of all recessed fixtures prior to purchasing any fixtures.
  7. Stems on stem mounted fixtures shall be approved ball aligner type, swivel 30 degrees from vertical with swivel below canopy. Paint stems the same color as the fixture trim. Stems in unfinished areas may be unpainted conduit.
  8. Fixtures installed on the exterior of buildings, on poles, or on pedestals shall be rated for wet location installation.
- B. Emergency and Exit lighting Fixtures shall be equipped with a Self-testing module which shall perform the following functions:
1. Continuous monitoring of charger operation and battery voltage with visual indication of normal operation and of malfunction.
  2. Monthly discharge cycling of battery with monitoring of transfer circuit function, battery capacity and emergency lamp operation with visual indication of malfunction. The battery capacity test may be conducted by using a synthetic load.
  3. Manual test switch to simulate a discharge test cycle.
  4. Modules shall have low voltage battery disconnect (LVD) and brownout protection circuit.
  5. All lighting fixtures and exit signs shown as emergency on drawings shall be provided with a minimum 1100 lumen emergency battery ballast capable of 90 minutes of illumination. No exceptions.
- C. Lamps: Type and size as scheduled, GE, Osram/Sylvania, Phillips, or approved equal.
1. LED bulb shape shall comply with ANSI C79.1. Lamp base shall comply with ANSI C81.61.
  2. Minimum CRI of LED lamps shall be 80 with a color temperature as shown on drawings.
  3. Rated life of all LED lamping shall be a minimum of 50,000 hours failure to 75% of lamp output.
  4. LED lamping shall be capable of dimming from 100% to 0%.

### **2.33. PANELBOARDS:**

- A. General: All panelboards shall be dead front type manufactured and installed in accordance with UL and NEMA standards, and shall carry a UL label. Ampacity, service voltage, and configuration shall be as indicated on drawings. Panelboards shall be clearly marked with ampacity, voltage, and maximum short current ratings.
- B. Manufacturer: Panelboards shall be as manufactured by Cutler-Hammer, GE, or Siemens.
- C. Enclosure:
1. Panelboard enclosures shall be as indicated on drawings.
  2. Unless otherwise indicated, all boxes shall be constructed of galvanized (or equivalent rust-resistant) sheet steel with hinged front trim.
  3. Fronts shall be door in door with two lockable latches to open door, lock, and latch. All panelboard locks shall be keyed alike. Piano hinges with screw latches will not be permitted.
  4. Fronts shall be finished with gray baked enamel over a rust-inhibiting phosphatized coating.

5. All dual section panels shall be equal in size. Sub-Feed circuit breakers will not be allowed to feed second section.
  6. Sub-Feed circuit breakers feeding additional panels or equipment shall be branch mounted.
  7. Provide permanent numbering of the panelboards. Stickers are not considered permanent.
  8. Any panelboard schedule that indicates more than 42 circuits shall be provided in two equally sized panelboards.
  9. Main circuit breakers shall be centered mounted. Main breaker cannot be mounted on buss bars with other circuit breakers.
- D. Buss Assembly:
1. Bussing shall be copper.
  2. The buss assembly A.I.C. shall be rated as indicated on drawings. Ratings shall be established by heat rise tests, in accordance with UL Standard 67.
  3. All bussing shall accept bolt on circuit breakers.
  4. Current carrying parts of all bussing shall be plated. In lighting and receptacle panels, bussing shall be designed for connection to the branch circuit breakers in the phase sequence format. Distribution panelboards shall be fully bussed.
  5. Ground bars shall be provided in all panelboards.
  6. Neutral bar shall be fully sized with lugs suitable for incoming and outgoing conductors.
  7. Provide insulated ground buss where indicated on the panelboard schedules.
- E. Circuit Breakers:
1. Circuit breakers shall be quick-make, quick-break, thermal magnetic, molded case, bolt on type.
  2. Circuit Breakers shall be numbered and arranged as indicated on the panelboard schedules and/or single line wiring diagrams. Numbers shall be permanently attached to trim.
  3. SWD Circuit Breakers: Single pole circuit breakers rated 15 and 20 amperes and intended to switch 277 volts or less fluorescent lighting loads shall be UL rated for switching duty and shall be marked "SWD".
  4. HACR Circuit Breakers: Circuit breakers 60 amperes or below, 240 volts, 1-, 2-, or 3-pole, intended to protect multi-motor and combination-load installations involved in heating, air conditioning, and refrigerating equipment shall be UL listed as HACR type and shall be marked "Listed HACR Type."
  5. Circuit breakers serving fire alarm systems, dedicated emergency/exit lighting circuits, and area of rescue communications systems shall be equipped with a screw-on, mechanical handle blocking device which locks the circuit breaker in the "ON" position.
  6. Circuit breakers serving circuits in residential bedrooms shall be Arc Fault Interrupting(AFI) type circuit breakers and shall be UL 1699 listed.
- F. Directories:
1. Each panelboard shall be equipped with a metal directory frame with a clear cover welded to the inside of the door.
- G. Equipment Short Circuit Rating: Short Circuit Interrupting Ratings shall be as indicated on the plans and schedules. Unless specifically indicated otherwise all rating are "Fully Rated" capacities. Where no rating is given, the contractor shall verify the available short current with the serving utility and provide equipment rated accordingly.
- H. Lighting panelboard cans shall be a maximum of 20" wide and 5 3/4" deep. Cans of multi-section panelboards shall be the same size.
- I. Provide nameplate as called out on drawings.
- J. All circuit breakers 1200-amp and up shall comply with NEC Article 240.87 Arc Energy Reduction.
- K. All flush mounted panel shall be provided with six (6) 3/4" conduit stubbed up above accessible ceiling.

## **2.34. DISTRIBUTION PANELBOARDS:**



- A. Furnish and install distribution and power panelboards as indicated in the panelboard schedule(s) or single line wiring diagrams and where shown on the plans.
- B. Panelboards shall be dead front, safety type equipped with thermal magnetic, molded case circuit breakers with trip ratings as indicated on the schedule(s).
- C. Panelboard bussing shall be copper.
- D. Panelboard buss structure and main lugs or main breaker(s) shall have the fault current ratings as indicated on the drawings. Ratings shall be established by heat rise tests conducted according to UL Standard UL67.
- E. Circuit breakers shall be equipped with individually insulated, braced and protected connectors. The front faces of all circuit breakers shall be flush with each other.
- F. Main circuit breakers shall be centered mounted. Main breaker cannot be mounted on buss bars with other circuit breakers.
- G. An engraved phenolic label shall be permanently attached to the front of the panelboard adjacent to each circuit breaker identifying the load served by the circuit breaker.
- H. Automatic tripping shall be clearly shown by the breaker handle taking a position between ON and OFF when the breaker is automatically tripped.
- I. Provisions for additional breakers shall be such that no additional connectors or hardware will be required to add breakers.
- J. The panelboard assembly shall be enclosed in a steel cabinet. The rigidity and gauge of steel shall be as specified in UL Standards. End walls shall be removable. The size of wiring gutters shall be in accordance with the National Electrical Code, NEMA, and UL Standards for panelboards.
- K. Cabinets shall be equipped with four piece fronts.
- L. The panelboard interior assembly shall be dead front with panelboard front removed.
- M. Main lugs or main breaker shall be barriered on live sides.
- N. The barrier in front of the main lugs shall be hinged to a fixed part of the interior. The end of the buss structure opposite the mains shall be barriered.
- O. Circuit breakers serving Fire Alarm Systems, Security Systems, and/or Emergency/Exit lights shall be equipped with mechanical, screw-on type, locking devices. These devices shall not be padlock type devices.
- P. Panelboards shall be listed by Underwriters' Laboratories and to bear UL label. Panelboards shall be rated for use as Service Entrance Equipment where required by the National Electrical Code. Panelboards shall be by Cutler-Hammer, General Electric, or Siemens.
- Q. Provide nameplate as called out on drawings.
- R. All circuit breakers 1200-amp and up shall comply with NEC Article 240.87 Arc Energy Reduction.
- S. All flush mounted panel shall be provided with six (6) ¾" conduit stubbed up above accessible ceiling.
- T. All service entrance main circuit breakers shall be 100% rated.

### **2.35. SAFETY SWITCHES:**

- A. Furnish and install safety switches as indicated on the drawings.
- B. Switches installed on 277/480 volts systems shall be rated for 600 volts and those installed on 120/208 volt or 120/240 volt systems shall be rated for 240 volts.
- C. Switches shall be NEMA Heavy Duty Type HD and Underwriters' Laboratory listed. Safety switches shall be Cutler Hammer, Siemens, or General Electric.
- D. General Duty disconnects will not be accepted.
- E. Enclosures for switches mounted outdoors shall be NEMA 3R or as indicated on the plans.
- F. Enclosures for switches installed in kitchen and dishwashing areas shall be NEMA 4X stainless steel or as indicated on the plans.

- G. All safety switches for equipment with remote controls shall be equipped with a control circuit disconnect interlock.
- H. Switches shall be lockable in the "ON" and in the "OFF" positions.
- I. Provide each disconnect with a nameplate that indicates equipment name, voltage/phase, and feed from location.
- J. Provide keyed brass locks on all disconnects that is located on the exterior of the building or in any area that is accessible to children or the public. All the brass locks shall be keyed the same, and turn over 10 sets of keys to the owner at substantial completion.
- K. Disconnect locations shown on drawings is diagrammatically shown. Disconnects shall be coordinated with other trades and placed in the optimal locations to serve equipment and shall be installed in the least obtrusive location. Disconnects will have to be moved at the cost of the contractor when there is conflicts with NEC clearances, access to space, or servicing of equipment. Architect/Engineer will have final judgment of proper location.

**2.36. MANUAL MOTOR STARTERS (TUMBLER SWITCH TYPE WITH OVERLOAD PROTECTION):**

- A. Starting and thermal overload protection for single phase motors 1/8 Hp to 1 HP shall be provided by manual motor starters with overload units rated as required by the specific motor to be served.
- B. Switches installed for site disconnect switches shall be equipped with padlocking provisions.
- C. Starters shall be by Cutler Hammer, General Electric, or Siemens with NEMA Type 1 enclosure or NEMA Type 3R enclosure where installed outdoors.

**2.37. TRANSIENT VOLTAGE SURGE PROTECTORS (SURGE PROTECTIVE DEVICES):**

- A. Provide transient voltage surge protectors (Surge Protective Devices) where indicated on the plans. At a minimum provide on all service entrance panelboards/switchboards and any panelboard/switchboards on the secondary side of a dry-type transformer.
- B. Service Entrance Panelboards and at Subpanel Protectors shall be listed and labeled and components recognized in accordance with UL 1283 and UL 1449 Second Edition, including highest fault current of Section 37.3.
- C. All devices shall meet or exceed the following:
  - 1. NEMA LS 1-1992.
  - 2. Minimum surge current capability, single pulse rated, per mode:
    - a. Service Entrance – 100 kA (200 kA per phase)
    - a. Distribution and branch panelboards – 80 kA (160 kA per phase)
  - 3. UL 1449, Second Edition, Listed and Labeled, and Recognized Component Suppressed Voltage Ratings shall not exceed (1.2x50 $\mu$ s, 6kV open circuit and 8x20 $\mu$ s, 500A short circuit test wave forms at end of 6" lead):
 

Voltage	L-N	L-G	N-G	L-L
208Y/120v	400	400	330	700
  - 4. Testing shall be done at the end of 6" leads with the complete unit including any fuses and all other components making up the unit.
- D. The devices shall have a minimum EMI/RFI filtering of –50dB at 100kHz with an insertion ratio of 50:1 using MIL-STD-220A methodology.
- E. Devices shall utilize MOV's of 25 mm diameter or larger, shall have pilot lights visible on the outside of the enclosure to indicate device operating condition, and shall provide contacts for remote monitoring of device condition.
- F. Devices shall be modular in design with individual module fusing and thermal protection.
- G. Devices shall incorporate visual alarm signals that indicate the failure of a single MOV and total loss of protection.
- H. Wye connected devices shall provide L-L, L-N, L-G, and N-G surge diversion with L-N/L-G bonded at service entrance devices. Delta connected devices shall provide L-L and L-G protection.

- I. Data Line Surge Protectors: Data Line Surge Protectors shall be UL 497B listed and labeled. The units shall be heavy duty devices utilizing a combination of silicone diodes and gas tube technology to provide surge protection.
- J. All devices shall have a minimum warranty period of five years, incorporating unlimited replacement of suppressor parts if they fail during the warranty period.
- K. Transient voltage surge suppressors shall be manufactured by AC Data Systems, Advanced Protection Technologies, Current Technologies, Cutler-Hammer, General Electric, Joslyn, Liebert, or MCG.
- L. **PROVIDE A TVSS UNIT ON ALL SERVICE ENTRANCE EQUIPMENT.**

**2.38. SECONDARY SURGE ARRESTERS:**

- A. Secondary surge arresters shall be UL listed under UL Classification (Lightning Protection) Surge Arresters(OWHX).
- B. Surge arresters shall be rated at same voltage and phase configuration as service.
- C. Arresters shall be equal to Cooper Power Systems ASZH Series, Cutler-Hammer, GE Tranquell, Joslyn Electronic Systems, Leviton, models as required to match the voltage of the system served.

**2.39. FUSES:**

- A. General: Fuses shall be UL listed time delay types with a minimum interrupting rating of 100,000 amps symmetrical.
- B. 200 amps and below: Provide Class RK-5 current limiting, time delay, rejection type as manufactured by Busman Manufacturing, Ferraz Shawmut, or Littlefuse.
- C. 201 to 600 amps: Class RK-1, current limiting, time delay, rejection type as manufactured by Bussman, Ferraz Shawmut, or Littlefuse.
- D. Above 600 amps: Class L current limiting, time delay, as manufactured by Busman Manufacturing, Ferraz Shawmut, or Littlefuse.

**2.40. LABELING:**

- A. Provide laminated plastic nameplates for each panelboard, equipment enclosure, relay, switch, and device.
- B. Each nameplate inscription shall identify the function and, when applicable, the position. Nameplates shall be melamine plastic 0.125 inch thick, white with black center core.
- C. Provide red laminated plastic label with white center core where indicated.
- D. Surface shall be matte finish. Corners shall be square. Accurately align lettering and engrave into the core.
- E. Minimum size of nameplates shall be one by 2.5 inches.
- F. Lettering shall be a minimum of 0.25 inch high normal block style.
- G. See Panelboard details for proper labeling of all panelboards.

**2.41. PHOTOCELLS, TIME SWITCHES AND CONTACTORS:**

- A. Photocells: Units shall have 1" diameter, hermetically sealed, cadmium sulfide sensing cell with 3-prong NEMA locking plug, rated for wet locations. Units shall have built-in time delay. Units shall be equal to Tork 5231 of correct voltage to match load or use with matching receptacle equal to Tork 2421.
- B. Time switches:
  - 1. Unless otherwise indicated on drawings, time switches shall be 24 hour electromechanical type having synchronous motor drive with two single pole double throw contacts rated 20 amps minimum.
  - 2. Unit shall have spring back up, with automatic rewind, capable of providing 16 hours minimum of reserve power upon electric power failure.
  - 3. Units shall be furnished in an enclosure, NEMA 1 indoor and NEMA 3 outdoors. Enclosures shall be flush mount unless otherwise indicated on drawings.

4. Units shall be Tork 7120L, or equal by Paragon or Sangamo.
  5. Time switch(es) shall be digital, seven day format, two channel time switches with 9v lithium battery 30 day back-up and with metal indoor enclosure. The controllers shall be equal to Tork #DW200A-Y.
- C. Contactors: Units shall be electrically held or electrically operated mechanically held, as indicated on drawings, and shall be recommended by manufacturer for type of load served.
  - D. Contacts shall double-break type of same ampere rating as line side circuit wiring.
  - E. Contacts shall be field-convertible to normally open or normally closed.
  - F. Contactor coils shall be encapsulated. Electrically held contactors shall have continuously rated coils. Mechanically held contactors shall be equipped with coil-clearing contacts to energize coils only when switching.
  - G. Units shall be furnished in an enclosure, NEMA 1 indoor and NEMA 3 outdoors.
  - H. Units shall be equal to Square D type L or LX.

#### **2.42. FIRE ALARM SYSTEM (ADDRESSABLE):**

- A. General: The contractor shall furnish and install a complete power limited automatic and manual fire alarm system, as specified herein and indicated on the drawings. The system shall include a central control panel, power supply, signal initiating devices, audible and visual alarm devices, provisions for connection of remote monitoring, a wiring system, and all necessary devices required to provide a complete operating system. The system shall comply with the applicable provisions of the National Fire Protection Association Standard Number 72 and meet all requirements of the local authorities having jurisdiction. The Underwriter's Laboratories, Incorporated, or approved by the Factory Mutual Laboratories shall list all equipment and devices. The equipment shall be EST to match existing. No deviation will be considered unless submittals are received and approved in writing, not less than ten days prior to bid date.
- B. Fire Alarm Document Box: The contractor shall furnish and install a fire alarm document enclosure as mandated by NFPA 72 Chapter 7.7.2.1. The system records documents box shall be constructed of 18 gauge cold rolled steel. It shall have a red powder coat epoxy finish. The cover shall be permanently screened with 1" high lettering and read "FIRE ALARM DOCUMENTS" with white indelible ink. The access door shall be locked with a 3/4" barrel lock which is keyed the same as the manufacturer's fire alarm panel. The enclosure shall supply 4 mounting holes to securely fasten to the wall. Inside the enclosure will accommodate standard 8.5" x 11" manuals and loose document records that may be placed in a three ring binder. All documents & software will be protected within the enclosure. A legend sheet will be permanently attached to the door for system required documentation, key contacts, and system information. The fire alarm document will have securely mounted inside the enclosure a minimum of 4 Gigabyte digital flash memory drive with a standard USB type B connector for uploading and downloading electronic information. The drive shall not be accessible without tools to any person whom gains access to the enclosure. The enclosure shall also provide 2 Key ring holders with a location to mount standard business type cards for key contact personnel.
- C. Control Panel: The control panel shall be an addressable type panel capable of handling up to 256 devices, with 60 hour minimum standby battery. The panel shall provide for the connection of alarm circuits as indicated and shall include the following features.
  1. The fire alarm panel shall detect the operation of any initiating device, indicate by annunciator lamps the area of the alarm condition, and operate all alarm auxiliary devices.
  2. A pilot light shall normally be on, indicating that the system is receiving power from the building service supply. A failure of the building service supply shall cause the lights to go out.
  3. A trouble light and trouble buzzer, operating together, shall signal any trouble condition. Failure of the building service supply, disarrangement in the system wiring, or alarm condition shall cause that trouble light to come on and the trouble buzzer to sound. A self restoring silencing switch shall be provided to silence the trouble buzzer, which shall be arranged so the trouble light will remain on until the system is restored to normal.

4. All notification signals shall be automatically locked in at the control panel until the operating device is returned to its normal condition, and the panel is manually reset. A switch shall be provided on the control panel for silencing the notification devices. The manual reset switch and the alarm-silencing switch shall be of the self-restoring type, which cannot be left in the abnormal position.
  5. The control panel shall provide relay contacts, of quantity as shown on the drawings, for control of heating, ventilation and air conditioning equipment. Such contacts shall be connected to air conditioning equipment, as indicated on drawings, for shutdown of individual units. Unit shutdown shall be initiated by duct-mounted smoke detectors unless otherwise indicated. Operation of any initiating device shall open all control contacts and release all mechanically held doors.
  6. The control panel shall be equipped with a front mounted Drill switch.
  7. Metal oxide varistors (MOV's) shall be provided on the system power supply and the municipal connection circuit to provide transient suppression protection to the control panel.
  8. Power Supply: The power supply shall be 24 Volt DC, filtered and regulated, and shall provide sufficient power for all system functions. The fire alarm system main power supply shall operate at 120 Volt AC obtained from the building service. The 120-volt AC main power shall be converted to low voltage direct current for system operation. The system shall operate on 24 volts DC with trickle charged batteries provided as an emergency source of supply for operating the system in the event of interruption of main power. A changeover relay in the control panel shall transfer to standby power automatically upon main power failure and automatically reconnect to main power upon restoration.
  9. New classroom addition Fiber Optic Cards. The control panel and all remote nodes shall be equipped with fiber optic, node-to-node capabilities at time of installation. Fiber Optic Transmission Cards shall be equal to EST Model SMXLO. All buildings shall be connected via fiber. No copper connections will be permitted.
  10. In existing High School building, all panels, annunciators, and other items shall be converted/upgraded to new panels with fiber nodes to allow for fiber only connection of new building(s). Once project is completed the system shall be a fully functional code compliant system. No allowances will be made for changes due lack of knowledge of existing system and what will be required to upgrade to fiber optic connected panel after the bid. Contractor shall verify number of annunciators and all other equipment to be replaced prior to bid.
- D. Manual Stations: Manual Fire alarm stations shall be an addressable double acting, semi-flush mounted type. Stations with two sets of contacts will not be acceptable.
  - E. Smoke Detectors: Smoke detectors shall be addressable photoelectric type with base.
  - F. Heat Detectors: Addressable 135 degree/rate of rise type with base.
  - G. Duct Mounted Smoke Detectors: Duct detectors shall be addressable photoelectric type with sampling tube.
  - H. Contractor shall be responsible for coordinating prior to bid with mechanical drawings to confirm all duct mounted smoke detector locations and quantities. Contractor shall include in their base bid price the cost of all additional duct mounted smoke detectors and circuitry needed for locations.
  - I. Duct Detector Remote Test Station: Test stations shall be keyed with indicator light.
  - J. Audible/Visual Notification Devices: Audible/visual notification devices shall be four wire, horn/strobe units capable of 90 dB audible output, 100 candela-second output, shall be ADA compliant. Devices using incandescent lamps will not be acceptable.
  - K. Visual Notification Devices: Visual notification devices shall be strobe units capable of 100 candela-second visual output, shall be ADA compliant. Devices using incandescent lamps will not be acceptable.
  - L. Voice Control Panel: The Voice Control Panel shall play a digitally recorded message or microphone input for evacuation instructions. The unit shall be installed next to the FACP, shall

be equipped with emergency battery power, and shall provide a minimum of 75 watts of amplification.

- M. Remote Microphone Panel: Remote Microphone Panels shall have a keyswitch control and shall be supervised.
- N. Remote Amplifier: Remote amplifiers shall be 120 watt with battery backup.
- O. Speaker/Visual Notification Devices: Speaker/Visual Notification devices shall be semi-flush, wall mounted, combination strobe/speaker assemblies with a minimum strobe output of 100 candella-second.
- P. Interface Relay:
  - 1. Provide addressable control modules or interface relays as required for interface of the Fire Alarm System with HVAC shut down, door holders, kitchen hood fire suppression system, and fan shut down, and any other locations required for proper interface and operation of systems.
  - 2. A control module or interface relay shall be provided for each duct mounted smoke detector and shall be the point of interface between the Fire Alarm System and the HVAC Control System.
  - 3. Contacts shall be rated for 10 A at 120 V.
- Q. Telephone Line Circuit: Terminals and other necessary facilities shall be provided in the control panel to permit automatic transmission of trouble and alarm signals over leased or private owned telephone cable to the fire, police, or other continuously manned facility, so designated for response to fire emergency.
- R. Annunciator Panel: Provide and install an annunciator that provides an audible and visual indication of an alarm or trouble condition for each zone, an alarm silence switch, and a key operated test and reset switch..
- S. Auxiliary Remote Power Supplies/Notification Appliance Circuit Extenders (NAC Panels):
  - 1. Provide auxiliary power supplies and/or NAC Panels where required for notification devices, door holders, annunciators, or for other devices requiring supplemental power.
  - 2. Remote power supplies shall include a filtered and regulated 24 VDC output, provisions for automatic transfer to battery back-up in case of primary power failure, and batteries sized for 60 hours of operation.
- T. Wire Guards: Wire guards shall be made of 3/16" minimum steel wire with a corrosion resistant coating equipped with integral mounting rings. Provide wire guards for all devices located in gymnasium.
- U. All devices installed on the exterior shall be weatherproof.
- V. Provide fiber optic interface/network cards in fire alarm and control panels for the school campus. Provide fiber optic cable as required by manufacturer to connect the Main High School Building panel and the Cafeteria panel. Fiber optic link shall allow full communications between the three fire alarm and control panels. Provide necessary electronic modules, equipment, cables and programming for communications between the all fire alarm panels.

#### **2.43. INTERCOM SYSTEM:**

- A. General: Intercom system in new construction to be added to the existing intercom system.
- B. Loudspeakers: Soundolier #C10, recessed ceiling mounted with flush baffle, back box, and necessary mounting hardware.
- C. Call-in-switch: Dukane 9A1770 with privacy control.
- D. Wiring: Use West Penn CL2-352 cable.

#### **2.44. CONCRETE:**

- A. Concrete for electrical requirements shall be:
  - 1. Composed of fine aggregate (sand), coarse aggregate (graded from three-sixteenth (3/16) inch to one (1) inch), Portland cement, and water proportioned and mixed so as to produce a plastic, workable mixture.

2. Aggregates shall be free from detrimental amounts of dirt, vegetable matter, soft fragments, or other foreign substances.
3. Water shall be fresh, clean, and free from salts, alkali, organic matter, and other impurities.
4. Concrete shall have a minimum 3000 psi ultimate twenty-eight day compressive strength and a maximum three (3) inch slump.

## **PART 3 - EXECUTION**

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### **3.01. GENERAL:**

- A. This section includes the installation of the complete electrical system.

### **3.02. ELECTRICAL SYSTEM DEMOLITION:**

- A. Before any new work begins the Contractor shall determine and document in writing to the satisfaction of the Engineer the condition of existing electrical work and auxiliary systems that are to remain in service. After the new work begins any existing electrical work or systems that are found to be inoperative or defective and not so documented shall be repaired or replaced by the Contractor at no additional cost to the Owner.
- B. Existing electrical equipment and materials to be reused shall be tested and repaired as required and installed for first class operation.
- C. General: The manner in which the remaining portions of the electrical system are terminated, supported and generally maintained for permanent use shall comply with all applicable regulations of the National Electrical Code, applicable NFPA codes and any local codes.
- D. Refer carefully to construction drawings prior to commencing with demolition to determine the intent of demolition. Contact the Engineer if there appears to be any conflict between the demolition and construction drawings.
- E. See "Renovation" Section regarding modification and relocation of circuits.
- F. Phasing: Phasing shall be as coordinated by the General Contractor.
- G. Work in Occupied Areas: Coordinate work carefully with General Contractor to provide minimum disruption to occupied portions of project. Provide minimum of 24 hours advance notice to Owner of demolition activities that will affect Owner's normal operation.
- H. Protections: Take necessary measures as required for protection of the Owner's personnel and the general public, as well as Owner's property. Provide temporary barricades, partitions, bracing, and weather protection as needed. Remove all temporary protections at completion of work.
- I. Flame Cutting: Do not use cutting torches for removal until work area is cleared of flammable materials. Maintain portable fire suppression equipment during flame-cutting operations.
- J. System Protection: Protect and maintain all portions of existing system not indicated for demolition, including but not limited to light fixtures, panelboards and circuits.
- K. Fire Protection: Coordinate with general contractor to insure that all penetrations of fire-rated decks and partitions are properly sealed.
- L. Removal of Circuits: All circuits indicated for removal shall be entirely removed, including raceway, back to take-off point or as far as possible without chasing (unless chasing is indicated). Where it is not possible to remove conduit, all conductors shall be removed and the conduit shall be permanently capped. Floor outlets indicated for removal shall be entirely removed, including outlet box, and capped below floor level (minimum 4" below floor level if in slab).
- M. Where floor slab is damaged in the course of demolition, it shall be permanently repaired as soon as practicable.
- N. Leave existing branch circuits and feeders which run through reworked areas and serve existing equipment to remain in service, continuous and uninterrupted.

- O. Where service interruptions are required, obtain approval for interruptions in writing from Architect 14 days prior to interruption. Submit schedule of work to be performed and the time required to accomplish work with request for interruption.
- P. Disposition of Material: Where electrical equipment is indicated for removal and not indicated for re-use, the owner shall have the option of taking possession of the equipment, the Contractor shall deliver any such material to a local site designated by the owner. The Contractor shall be responsible for disposing of all other materials in accordance with applicable codes and laws.

### **3.03. ELECTRICAL SYSTEM RENOVATION:**

- A. General: Provide renovations as indicated on drawings and specified herein as required for a complete, operational system, even though every item is not indicated.
  - 1. This Section is intended to serve as a supplement to the applicable sections within this Division, and in no way relieves the contractor from the requirements of any other Section.
  - 2. All renovations shall comply with all applicable regulations of the National Electric Code, applicable NFPA codes and any local codes
- B. Materials and workmanship: Execute all work so as to present a neat and workmanlike appearance when completed. Except where otherwise indicated, all materials shall be new, UL approved where a standard has been established. Where specific means and methods for affecting renovations are not covered in drawings and specifications, the contractor shall exercise prudent judgment in following accepted practices.
- C. Modifications: All major deviations from the drawings and specifications shall be approved in writing by the Engineer.
- D. Inspection:
  - 1. Inspect all existing electrical system components which are accessible, including fixtures, wiring devices, raceway and panelboards.
  - 2. Perform minor repairs to loose or damaged connections, damaged or missing supports, replacement of broken devices, replacement of missing plates and junction box covers and other visible damage or disrepair.
  - 3. Report major damage to Engineer.
- E. Renovation Services: In addition to the scope of work indicated on the drawings and specified herein, it shall be the responsibility of this Division to provide minor modification and repair services made necessary to electrical system components through the normal course of renovation. Such services shall include but not be limited to minor repair or relocation of branch circuits necessitated by the work of other trades, as coordinated by the General Contractor.
- F. Penetrations: Coordinate penetrations of existing walls, decks, and roofs required for electrical system with General Contractor. Do not cut structural members without the prior consent of Structural Engineer.
- G. Raceway.
  - b. Unless specifically indicated otherwise, existing raceway may not be used.
  - c. Where existing raceway is indicated for possible re-use, it shall be the responsibility of this Division to verify that the condition and configuration of the raceway is in compliance with the NEC.
- H. Panelboards: Where new circuits are run to an existing panelboard, thoroughly inspect the panelboard for any indications of arcing, overheating, or other damage. Report damage to the Engineer. Unless specifically allowed, tandem circuit breakers shall not be utilized.
- I. Clearing of Neutral Faults: Any and all neutral faults to ground on existing system shall be corrected.
- J. Service Ground: Visually inspect existing service ground electrode system for damage and code compliance. Check continuity from panel to each electrode with a meter. Make repairs as required.
- K. Lighting Fixtures: Where existing lighting fixtures are indicated for re-use, they shall be thoroughly cleaned and relamped, no exceptions. Where existing lighting fixtures are indicated for replacement, it shall be the responsibility of this Division to verify the compatibility of new



fixtures with existing ceiling type, existing penetrations, available support, and other existing conditions prior to submittal of fixtures. Any variances or required modifications shall be clearly indicated on the fixture submittal.

- L. Backfilling, Grading, and Sodding:
  - 1. Restore surface features, including vegetation, at areas disturbed by Work of this Section.
  - 2. Reestablish original grades, unless otherwise indicated.
  - 3. If sod has been removed, replace it as soon as possible after backfilling is completed.
  - 4. Restore areas disturbed by trenching, storing of dirt, cable laying, and other activities to their original condition.
  - 5. Include application of topsoil, fertilizer, lime, seed, sod, sprig, and mulch. Comply with Division 2 Section "Landscaping." Maintain restored surfaces.
  - 6. Restore disturbed paving as indicated.

### **3.04. ELECTRICAL SERVICE:**

- A. General: Arrange with local electric Utility Company for service to be brought to the building, and for installation of meter. Provide all material and labor not supplied by Utility Company so as to produce a complete installation meeting the Utility regulations.
- B. Service requirements: It is the responsibility of this Section, prior to bid, to reaffirm with the Utility Companies involved, that locations, arrangement, Power Company voltage, phase, metering required, and connections to utility service are in accordance with their regulations and requirements. If their requirements are at variance with these drawings and specifications, contract price shall include an additional cost necessary to meet those regulations without extra cost to Owner after bids are accepted.
- C. Notify Architect of any changes required before proceeding with work.
- D. Fees and deposits:
  - 1. The Electrical Contractor shall be responsible for verification and payment of all utility fees associated with installation of the electrical service.
  - 2. The Owner shall pay the cost of establishing an electrical service account and permanent meter deposit.
- E. Metering: Obtain metering equipment from Utility Company and install in compliance with the Utility Company's requirements. The Electrical Contractor shall provide and install all necessary metering raceways, fittings, supports, connectors and ground conductor necessary for a complete installation. Provide 100# pull wire in all metering conduits.
- F. Main Service Equipment: Provide UL approved service entrance components as indicated on drawings or specified herein.
- G. Provide a full size copy of the AS-BUILT Power Riser Diagram framed behind plexiglass screwed to the wall near service entrance in main electrical room.
- H. Service lateral or feeder: Extend lateral or feeder of the size shown on drawings from service equipment to the point of service as indicated (verify exact location with Utility Company).
  - 1. For Overhead Service, provide and install service entrance fitting on conduit and leave sufficient slack conductor for connection to utility feeder 10' above finish grade, 12' above drive and 18' above street.
  - 2. For Underground Service, provide and install underground conduit to utility riser, as directed by Utility Company. Conduit shall be of size and quantity as indicated on drawings. Provide 480# polypropylene pull line in each empty conduit.
  - 3. For Underground Service, provide and install transformer pad, primary underground conduit to utility riser as directed by Utility Company, underground secondary conduit, and secondary conductors. Conduit shall be of size and quantity as indicated on drawings. Provide spare 4" conduit in transformer pad extending 2' beyond edge of pad with PVC cap. Provide 480# polypropylene pull line in each empty conduit.
  - 4. On service transformers with multiple taps, it shall be the responsibility of this section to coordinate tap selection with the electric utility to insure the proper nominal voltage.

### **3.05. GROUNDING:**

- A. Bond the neutral conductor and various conductive materials in the building per NEC Article 250.
- B. Grounding Electrode System: A bare copper grounding conductor shall be bonded to grounding electrodes as specified below. This conductor shall serve as ground for system neutral and for building equipment bonding. Where conductor is #6, or smaller, or is subject to injury, it shall be run in conduit, Schedule 80 PVC or Rigid Galvanized to which the conductor shall be bonded at both ends.
  - 1. Grounding electrodes shall be as follows:
    - a. Cold water piping, if metal and in direct contact with the earth for 10 feet or more, at the point of entry into the building. Grounding electrode shall be attached with UL approved bronze clamp.
    - b. Building structural steel, if present and accessible.
    - c. Grounding electrode shall be attached with exothermic weld connector.
    - d. Foundation reinforcing bar system. Coordinate with General Contractor to provide turned up re-bar (sleeved) near service point for attachment of grounding electrode above grade. Grounding electrode shall be attached with UL approved bronze clamp or exothermic weld connector.
    - e. Driven ground rod(s).
      - 1) Three 3/4" x 10' copper weld rods shall be driven into the ground at the lowest point adjacent to the building, spaced a minimum of 10' apart.
      - 2) Ground rods shall be driven to 12" below grade.
      - 3) The grounding electrode conductor shall be attached to the rod(s) with UL approved bronze clamp or exothermic weld connector.
    - f. Existing grounding electrode system. If an existing electrical service is in place, it must be bonded to the new grounding electrode system.
- C. Connections to grounding rods, building structure, counterpoise, and conductor junctions shall be made by exothermic weld unless specifically noted otherwise.
- D. Electric system (neutral) ground: The current carrying neutral leg of the wiring system shall be of insulated conductor, and shall be connected to the grounding electrode conductor only via the neutral connection at the service equipment. Each branch circuit or multi-outlet branch circuit shall be provided with a dedicated neutral conductor.
- E. Equipment grounding conductors:
  - 1. An equipment grounding conductor (copper with green insulation except where bare copper is used) shall be provided in all wiring raceways.
  - 2. Sizes shall be in accordance with NEC 250.
  - 3. The equipment grounding conductor shall originate in the same panelboard, panelboard section, as the circuit conductors.
  - 4. The equipment grounding conductor bonding the sections of multi-section panelboards shall be sized per NEC 250.
  - 5. The equipment grounding conductor is not included in number of branch circuit conductors indicated on the drawings.
- F. Gas piping: Bond interior above grade gas piping to the grounding electrode.
- G. Telephone service ground: provide a minimum #6 bare, solid copper grounding conductor from the electrical service grounding connection to the TBB. Leave six (6) feet minimum of free conductor. Install the conductor in PVC conduit where inside the building.
- H. Computer backboard ground: provide a minimum #6 bare, solid copper grounding conductor from the electrical service grounding connection to the CBB. Leave six (6) feet minimum of free conductor. Install the conductor in PVC conduit where inside the building.
- I. Metal Lighting poles: Provide a grounding electrode at poles supporting outdoor lighting fixtures in addition to installing a separate equipment grounding conductor with supply branch-circuit conductors.
- J. Grounding electrode resistance shall be less than 15 ohms. The resistance of the grounding electrode shall be tested by the Fall of Potential Method.

- K. Lighting Standards (Poles): Install 10' driven ground rod at each pole. On non-metallic poles, ground metallic components of lighting unit and foundations. Connect fixtures to grounding system with No. 6 AWG conductor.
- L. Each grounding conductors at the service entrance ground bus bar shall be provided with a brass round identifying tag. Tag shall indicate where ground wire is terminated.

### **3.06. EXCAVATION, CUTTING AND BACKFILLING:**

- A. Provide cutting and patching, under the supervision of the General Contractor, as required for the work in Section 16.
- B. Locate all existing below grade and/or below floor utilities prior to beginning any site excavation or cutting of existing floor slabs. The Contractor shall repair any damage to existing utilities or systems.
- C. Saw cut existing concrete slabs and asphalt paving.
- D. Trenching:
  - 1. Dig trenches true to line, with a flat, even bottom.
  - 2. Width of the trench shall provide not less than 3 inches clearance from the conduit to each side of the trench.
  - 3. Insure that foundation walls and footings and adjacent load bearing soils are not disturbed in any way.
  - 4. Conduits shall be installed below footings where possible. Where a line passes under a footing, make crossing with the smallest possible trench to accommodate the conduits/sleeves.
  - 5. Where a line must pass adjacent to and blow the bottom of a column footing, or the corner of a continuous footing, backfill the trench with concrete up to the level of the footing bottom, for a distance away from the footing equal to the depth of the fill.
  - 6. Keep excavation free from water, by pumping if necessary.
  - 7. Where rock, soft spots, or sharp-edged materials are encountered, excavate the bottom for an additional 3 inches, fill and tamp level to proper elevation with sand or earth free from particles that would be retained on a 1/4 inch sieve.
  - 8. Remove and relocate existing obstructions as directed.
  - 9. The Contractor shall be responsible for the repair and/or replacement of any damage to existing utilities, structure, or finishes.
  - 10. Coordinate work with other trades as work progresses so cutting and patching will be minimal.
  - 11. Refer to Section "Earthwork" for shoring, sub-soil assumptions and data, work around trees, surplus earth, etc.
- E. See Section 16100, "Conduit Installation, Below grade and below slab conduit installation", for installation of conduits in trenches.
- F. Backfilling:
  - 1. Immediately after inspection, cover conduits with 3" of compacted sand or earth free from particles that would be retained on a 1/4 inch sieve. Do not to disturb the alignment or joints of the conduits.
  - 2. Carefully backfill with 4" of earth free from clods, brick, etc., firmly puddling and tamping.
  - 3. Thereafter, puddle and tamp every vertical 4" for hand tamping or 8" for heavy duty mechanical tamping.
  - 4. Backfill shall meet the compaction requirements set forth in Division 2.
  - 5. Backfilling Beneath Slabs and Pavement: Trenches beneath future slabs or pavement, including but not limited to buildings, drives, parking areas, sidewalks, playground surfaces, and equipment pads, shall be backfilled, from 3" above top of conduits to final grade, with crushed aggregate, AHD 825, type B, compacted in 4" layers to 100% ASTM 698.
  - 6. Install marking tape above conduits at 12 inches below grade.

### **3.07. SLEEVES, INSERTS, AND SUPPORTS:**

- A. Provide and install No. 16 gauge galvanized steel or iron sleeves in all walls, floors, ceilings, and partitions. Sleeves shall have no more than 1/2" clearance around pipes and insulation.
- B. The contractor shall furnish to other responsible trades all sleeves, inserts, anchors and other required items which are to be built in by other trades for securing of all hangers or other supports by the Contractor.
- C. The contractor shall assume all responsibility for the placing and sizing of all sleeves, inserts, etc., and shall either directly supervise or give explicit instructions to other trades for their installation.
- D. The contractor shall seal all conduits through floors, smoke partitions, and floor partitions, with a sealant approved for the application.
- E. All sleeves through sound barrier walls and partitions shall be sealed with mineral wool.
- F. Through the floor conduit penetrations shall be sealed watertight.
- G. Furnish and install steel angles and channels as required for mounting and bracing heavy equipment and conduits. Steel shall be securely bolted or welded to structure and equipment bolted to the steel framework. Obtain the approval of the Architect prior to welding.

### **3.08. BELOW GRADE THRU WALL WATER SEALS:**

- A. Each conduit penetrating exterior, below grade, cast concrete walls shall have the annular space around the conduit sealed with an approved Thru Wall Water Seal System.
- B. Where the system includes water seal thru wall sleeves, the Electrical shall provide properly sized sleeves to the contractor responsible for constructing the walls and shall be responsible for the proper location of each sleeve.
- C. Where openings are to be core drilled, the Electrical Contractor shall be responsible for the core drilling and for coordinating proper sizing and location of each opening.

### **3.09. FIRE STOPPING:**

- A. The Electrical Contractor shall be responsible for firestopping of all penetrations of fire rated partitions made by any and all lighting, power, and auxiliary circuiting, sleeves and/or equipment.
- B. The Electrical Contractor shall submit manufacturers' UL System drawings for the systems to be utilized. The systems shall be compatible with the partition ratings as indicated on the Architectural drawings and in accordance with details on the Electrical drawings.
- C. Penetrations of fire rated partitions shall be sealed with an approved fire sealant resulting in the completed penetration having the same fire rating as the partition.
- D. The installation shall be in accordance with the manufacturer's UL system detail and installation instructions to attain the required fire partition rating.
- E. Empty sleeves through 1 and 2 hour rated partitions shall be plugged with mineral wool.
- F. Sleeves through 4 hour rated partitions shall be plugged with mineral wool and fire stopping material.

### **3.10. ROOF PENETRATIONS:**

- A. Furnish roof flashing for all equipment, installed under Section 16, which penetrates through the roof. Flashing shall be approved by the Architect prior to installation.

### **3.11. CONDUIT INSTALLATION:**

- A. Conduits shall be as follows:
  - 1. Overhead Service Entrance - Rigid Galvanized Steel (RGS) Conduit or IMC.
  - 2. Underground Service Laterals: Schedule 40 rigid PVC in horizontal runs with rigid galvanized steel elbows turning up to vertical RGS.
  - 3. Where subject to moisture or mechanical injury - RGS conduit.
  - 4. ALL conduits exposed to moisture or subject to mechanical damage shall be RGS. Where conduit exits building, the changeover from EMT to rigid shall be inside exterior wall.
  - 5. In open shop and industrial installations RGS shall be run to 10' A.F.F.

6. All conduit exposed on the outside of the building envelope shall be Rigid Galvanized Steel (RGS) conduit. This includes all conduits on and/or under canopies or awnings.
  7. In concrete or solid masonry – RGS conduit
  8. Above furred spaces or in cells of hollow masonry - EMT
  9. Concealed inside drywall construction walls and above lay-in ceilings – EMT.
  10. Exposed conduits:
    - a. Conduits installed exposed in shop, warehouse, and manufacturing areas shall be RGS up to 12' A.F.F. Conduits in such spaces above 12' A.F.F. may be EMT unless indicated otherwise on the drawings.
    - b. Exposed indoors in non-hazardous unfinished areas not subject to physical damage - EMT
    - c. Exposed in kitchen and dishwashing areas: Rigid aluminum.
  11. Branch circuits in slab (3/4") - PVC. Turn up through slab with RGS ells - no exceptions. Extend rigid turn-ups 2" minimum above finish floor level.
  12. Circuits beneath building vapor barrier - PVC. Turn up through slab with RGS ells - no exceptions. All elbows 45° and greater shall be RGS. Extend RGS turn-ups 2" minimum above finish floor level.
  13. Below Grade – PVC with RGS, or rigid aluminum where applicable, elbows turning up to vertical. All below grade elbows 45° and greater shall be RGS.
  14. Motor, HVAC equipment, and vibrating equipment connections - flexible metal conduit, liquid tight flexible metal conduit outdoors, in kitchen and dishwashing area, or in other wet areas. Liquidtight flexible nonmetallic conduit shall be used only where specifically indicated.
  15. IMC may be used where RGS is indicated.
- B. Conduit sizes:
1. Unless specifically indicated otherwise herein or on the drawings, the minimum conduit size shall be 3/4".
    - a. All conduits installed below grade or below slab shall be 3/4" minimum.
    - b. The minimum size for flexible lighting fixture "whips" shall be 3/8" and the maximum length shall be 6 feet. Lighting fixture "whips" shall be defined as flexible conduits with conductors feeding one or more recessed lighting fixtures installed in suspended, lay-in, acoustical ceiling systems from a single junction box.
    - c. 1/2" conduit may be for final connections to equipment or fixtures where conduit is less than three (3) feet in length and is extended from a junction box or from a 3/4" conduit stub up.
  2. Conduits shall be sized in accordance with the National Electrical Code as adopted by the local authority having jurisdiction or as amended to date, except where a larger size is indicated on the drawings or specified herein.
- C. Layout:
1. Generally follow the conduit layout shown on the drawings. However, the layout is diagrammatic only and must be adjusted for structural conditions, built-in equipment and other factors. Offsets are not indicated and must be furnished as required.
  2. Install all conduits concealed except in equipment rooms and where exposed runs are specifically indicated.
  3. Install conduit runs to avoid proximity to steam or hot water pipes. In no place shall a conduit be run within 6" of such pipes except where crossings are unavoidable, then conduit shall be kept at least 1" from the covering of the pipe crossed.
  4. Eliminate trapped runs insofar as possible.
  5. Do not chase new work, but instead build in conduit as work progresses.
  6. Do not run conduit in cavity of exterior walls.
  7. Run concealed conduits in direct line with long sweep bends and offsets where practicable.
  8. Install exposed conduit with runs parallel or perpendicular to walls, structural members, or intersections of vertical planes and ceilings, with right-angle turns consisting of cast-metal fittings or symmetrical bends.
  9. Where conduits are indicated exposed overhead, runs down to wall outlets shall be concealed in wall.

D. Conduit Installation:

1. Securely fasten conduits to all sheet metal outlets, cabinets, junction and pull boxes with locknuts and bushings, taking care to see that stout mechanical and solid electrical connections are obtained.
2. All conduits shall have bushings with smooth beveled throats installed at both ends prior to installing conductors. Split bushings around conductors shall be taken to indicate that the conductors were pulled into conduit without the proper bushings installed and a basis for requiring the replacing of the conductors.
3. Conduits entering service enclosures (panelboards, disconnect switches, switchboards, motor control centers, etc. used as service entrance equipment) shall be provided with specification grade, insulating, grounding type bushings. Grounding bushing shall be bonded together and bonded to the service grounding buss.
4. Support:
  - a. Raceways shall be securely and rigidly supported to the building structure in a neat and workmanlike manner, and wherever possible, parallel runs or horizontal conduit shall be grouped together on adjustable trapeze hangers.
  - b. Support shall be provided at appropriate intervals not exceeding eight(8) feet with straps, hangers, and brackets specifically designed for the application.
  - c. Channels shall be 1 inch for 18-inch wide trapeze, 1-3/8 inch for 24 to 30 inch, and 1-5/8 inch for over 30 inch wide trapeze.
  - d. Perforated steel straphangers, "butterfly clips", or tie-wire supports are not acceptable.
  - e. Conduits shall not be supported from ceiling support wires.
  - f. Conduits installed along wall surfaces shall be supported with galvanized steel brackets specifically designed for conduits and sized for the conduit used.
  - g. PVC conduits shall be supported per the NEC with PVC or stainless clamps and stainless steel hardware.
  - h. Attach to supporting devices with screws, bolts, expansion sleeves or other workmanlike means appropriate to the surface.
  - i. In stud walls, anchors shall be completely rattle proof.
  - j. For conduits in damp and wet locations, use stainless steel clamps and stand-offs, or galvanized malleable or cast iron clamps and spacers.
  - k. All mounting hardware for aluminum conduit shall be stainless steel.
  - l. Surface mounted conduits installed in kitchen and dishwashing areas shall be supported off walls approximately 3/16".
5. Thread rigid conduits so that the ends meet in couplings; cut ends square, ream smooth and draw up tight.
6. All field cut threads shall be cleaned with a solvent such as mineral spirits and painted with two coats of galvanize primer.
7. Cap conduit ends to keep out water and trash during construction.
8. Field made bends:
  - a. Avoid field-made bends where possible, but where necessary, use a proper hickey or conduit-bending machine.
  - b. Field made bends in PVC conduit shall be made with a heated PVC conduit bender.
  - c. Make no bends with radius less than six times the conduit diameter, nor more than 90 degrees.
9. Make changes in direction with pull boxes, symmetrical bends and/or cast-metal fittings.
10. Total bends in any conduit run shall not exceed the equivalent of four, quarter (90°) bends for a total of 360°, per NEC, between pull boxes.
11. Replace any crushed or deformed conduits.
12. Conduits passing through roofs shall be in place before roof is installed.
13. Conduits installed in concrete/grout filled CMU walls shall be Rigid steel or IMC conduits installed field wrapped with 0.010 inch thick pipe-wrapping plastic tape applied with a 50 percent overlay. Painted on coating shall not be acceptable.
14. Where conduits pass through or across building expansion joints, provide hot-dipped galvanized expansion fittings with bonding jumpers.
15. Insure that all penetrations of firewalls are sealed per NEC and IBCC.

16. Right and left couplings shall not be used; conduit couplings of the Erikson type shall be used at location requiring such joints.
  17. Paint all conduits exposed in finished spaces. Paint shall consist of one coat of zinc rich primer plus two top coats of water-based latex paint, color to match adjacent finishes. Verify colors and paint system with Architect.
  18. All conduit runs entering the building from outdoors shall be sealed against moisture migration and condensation by filling with insulating type foam.
  19. All conduits passing through walls of coolers or freezers shall have seal fitting installed on the outside of the cooler/freezer wall and within 3" of the wall. Fitting shall be sealed per manufacturer's recommendations.
  20. Install telephone, data, intercom, and signal system raceways, 2-inch trade size and smaller, in maximum lengths of 150 feet and with a maximum of two 90-degree bends or equivalent. Separate lengths with pull or junction boxes where necessary to comply with these requirements, in addition to requirements above.
- E. Below grade and below slab conduit installation:
1. See Section 16100, "Excavation, Cutting, and Backfilling" for trenching and backfilling requirements.
  2. Rigid steel or IMC conduits installed below slab-on-grade or in the earth shall be field wrapped with 0.010 inch thick pipe-wrapping plastic tape applied with a 50 percent overlay, or shall have a factory-applied polyvinyl chloride, plastic resin, or epoxy coating system. Painted on coatings shall not be acceptable. Wrap shall extend a minimum of 1" above slabs or 3" above finished grade where there is no slab. Alternate methods must approved by Engineer prior to bids.
  3. Top of the conduit shall be not less than 30 inches below grade.
  4. Run conduit in straight lines except where a change of direction is necessary.
  5. Conduits stubbed up from below grade or slab into exterior walls shall be turned toward the interior of the building below slab fill perpendicular to the wall. Conduits shall not be turned out toward the exterior unless specifically indicated to do so.
  6. Placing of conduits below slab on grade:
    - a. Conduits 1-1/4" and larger shall be installed a minimum of 12" below the bottom of slab in the clay/sand fill below any gravel fill material.
    - b. Conduits 1" and smaller may be installed in the porous/gravel fill below the vapor barrier.
  7. Multiple Conduits:
    - a. Separate multiple conduits by a minimum distance of 2-1/2 inches horizontally and 3 inches vertically, except that light and power conduits shall be separated from control, signal, and telephone conduits by a minimum distance of 3 inches horizontally and vertically.
    - b. Where multiple layers of conduits are to be placed in a trench, each layer shall be placed in the trench, straight and parallel, clear fill material (see Excavation, Cutting, and Backfilling) placed and tamped in place to provide the specified spacing, and each subsequent layer placed in the same manner.
    - c. Stagger the joints of the conduits by rows and layers to strengthen the conduit assembly.
    - d. Conduits shall not be placed haphazardly in the trench.
  8. Where conduits pass through footings or foundation walls:
    - a. Conduits roughed in beneath slab shall exit the foundation perpendicular to the building spaced approximately 3" apart. Conduits shall be arranged in a single horizontal row where practical.
    - b. Secure approval from the Architect and Structural Engineer prior to penetrating any footing or foundation wall.
    - c. Schedule 40 PVC sleeves shall be cast in the footings or foundation wall for the conduits to pass through.
    - d. Multiple sleeves shall have 3" clearance, vertically and horizontally, between the sleeves unless directed otherwise by the Architect and/or Structural Engineer.

9. Where PVC conduit is installed below grade a PVC to rigid metallic conduit coupling shall be installed in the horizontal run and a rigid galvanized steel conduit elbow installed to turn up to above grade. Where above grade conduits are indicated to be rigid aluminum the elbow turning up to vertical shall be rigid aluminum.
  10. Rigid aluminum conduit shall be wrapped same as RGS through concrete from 2" each side of the concrete.
  11. Rigid galvanized conduit shall extend a minimum of 6" above the finished floor level.
  12. In hazardous areas the coupling shall be below grade and a single section of conduit installed up to 18" A.F.F. to accept the required seal fitting.
  13. Wiring shall be extended in rigid threaded conduit to equipment, except that where required, flexible conduit may be used from 6 inches above the floor to the served equipment.
  14. Conduits shall exit concrete slabs vertically.
    - a. Where adequate support cannot be obtained by wiring to reinforcing steel, obtain support with solid iron stakes (which may be driven through membrane) cut off flush with slab after pouring.
    - b. At turn-ups of adjacent runs of exposed conduit, obtain alignment by wiring members to a temporary horizontal member.
  15. Empty or spare conduit stub-ups shall be capped with a threaded cap.
  16. Encasement Under Roads, Structures, and at other locations indicated on the drawings:
    - a. Under roads, paved areas, railroad tracks, and other locations indicated on the plans install conduits in concrete encasement of rectangular cross-section providing a minimum of 3 inch concrete cover around ducts.
    - c. Provide plastic duct spacers that interlock vertically and horizontally. Spacer assemblies shall consist of base spacers, intermediate spacers, and top spacers to provide a completely enclosed and locked-in conduit assembly.
    - d. Install #4 rebar at each corner of the encasement and at not more than 18" on center vertically and horizontally on the sides of the encasement. #4 rebar hoops shall be installed at not more than 18" on center along the length of the encasement.
    - e. Concrete encasement shall extend at least 5 feet beyond the edges of paved areas and roads, and 12 feet beyond the rails on each side of railroad tracks.
  17. Conduits to be installed under existing paved areas, which are not to be disturbed, and under roads and railroad tracks, shall be installed through a zinc coated, rigid steel, sleeve, jacked into place.
  18. Conduits installed between handholes, manholes or other accessible areas shall have a minimum slope of 3 inches in each 100 feet away from buildings and toward manholes and other necessary drainage points.
  19. The contractor shall provide properly rated and sized junction and pull boxes as required on all underground conduit runs 150 feet and greater so as to minimize pulling tensions on cables to be installed in conduits. In no case shall pull or junction boxes be further than 300 feet apart. Provide pulling tension calculations on all underground runs over 200 feet as required in Paragraph 1.09 Submittals.
- F. Conduit Installation in concrete slabs:
1. Conduit installed in concrete slabs shall be rigid steel or IMC. Rigid steel or IMC conduits installed in slabs-on-grade shall be field wrapped with 0.010 inch thick pipe-wrapping plastic tape applied with a 50 percent overlay, or shall have a factory-applied polyvinyl chloride, plastic resin, or epoxy coating system. Painted on coatings shall not be acceptable.
  2. At slabs on grade, conduit, 3/4" maximum, may be run in the slab; larger conduit shall be run below slab.
  3. Where adequate support cannot be obtained by wiring to reinforcing steel, obtain support with solid iron stakes (which may be driven through membrane) cut off flush with slab after pouring.
  4. At turn-ups of adjacent runs of exposed conduit, obtain alignment by wiring members to a temporary horizontal member.
- G. Flexible conduit:



1. At motor or equipment connections:
    - a. The maximum length allowable for flexible conduit shall be 36 inches except at lighting fixtures.
    - b. Flexible conduit installed outdoors shall be installed so as to provide an 8 inch minimum drip loop as measured from the lowest end of the conduit.
  2. At lighting fixture connections provide flexible steel conduit by one of the manufacturers named for rigid.
    - a. Maximum length allowable shall be 72 inches.
    - b. Support flexible conduit such that it does not contact the ceiling system, ductwork, or other equipment above the ceiling. The conduit shall not be attached to a ceiling or ceiling support system.
    - c. All fixture whips shall be supported within 12" of outlet/junction boxes with single hole clamps.
- H. Empty conduit:
1. Install a #14 galvanized fish wire or polypropylene pull cord with 14-inch free ends in all empty power and/or auxiliary conduits.
  2. All conduits indicated to be terminated above the ceiling shall have an elbow turned out above the ceiling and shall be terminated with an insulating bushing.
  3. Empty conduits stubbed out of buildings below grade:
    - a. Empty conduits stubbed out of buildings below grade shall extend 5 feet outside of the building foundation.
    - b. Install a 12"x 12"x 6" concrete marker at grade, above the end of the conduits, with "ELEC" inscribed on top.
    - f. Note on as-built drawings the exact location where empty conduit(s) are stubbed out below grade to the building exterior. Indicate conduit sizes and number of each size.
    - g. The contractor shall provide properly rated and sized junction and pull boxes as required on all underground conduit runs 150 feet and greater. In no case shall pull or junction boxes be further than 200 feet apart.
- I. Conduit entries into enclosures, panelboards, and wiring troughs:
1. Layout conduit entries carefully to allow clearances for the number and sizes of conduits, electrical equipment, and future expansion.
  2. In sheet metal equipment use Greenlee Knock-Out punch, or equal, to cut holes for conduit installation. Do not drill holes, or cut holes out with snips or torch.
  3. In cast enclosures and boxes drill conduit openings with correct size drill for tight fit.
- J. **All junction box covers above the ceiling shall be labeled to which circuits or systems they contain.**

### 3.12. CONDUIT BODIES:

- A. Conduit bodies shall be sized in accordance with NEC 370, and 373.
1. Conduit bodies for conductor sizes AWG #4 and larger shall be mogul type bodies sized in accordance with NEC 370-28.
  2. Conduit bodies for conductor sizes AWG #6 and smaller shall be sized in accordance with NEC 370-16(c).

### 3.13. JUNCTION AND PULL BOXES:

- A. Junction and pull boxes shall be sized per NEC to accommodate the installed number and size of conductors and conduits.
- B. Boxes shall be securely fastened in place.
- C. Boxes serving lighting fixtures installed in accessible, suspended ceilings:
1. Provide number of boxes as required to maintain fixture whips within the 6' maximum length.
  2. Generally attach to underside of structure above, in accessible location, to accommodate a maximum 6' flexible conduit connection to each fixture or fixture run.
  3. Where the structure above is more than 18" above the ceiling the boxes shall be supported within 18 inches of the ceiling with all thread rod and/or strut.

- D. Install galvanized steel utility box plates, by box manufacturer, at exposed conduit fittings or boxes.
- E. **All junction box covers above the ceiling shall be labeled to which circuits or systems they contain.**

#### **3.14. WIRE AND CABLE INSTALLATION:**

- A. No conductor shall be smaller than #12 except where so designated on the drawings or specified elsewhere.
- B. Multiwire lighting branch circuits shall be used where indicated.
- C. Wiring devices shall be connected such that each device can be removed without interrupting the neutral or equipment grounding conductors serving other outlets on the same circuit(s).
- D. Joints and splices in wire shall be made with solderless connectors, and covered so that insulation is equal to conductor insulation. Wire nuts shall not be used for conductor #8 and larger.
- E. No splices shall be pulled into conduit.
- F. Both conductors and conduit shall be continuous from outlet to outlet.
- G. No conductor shall be pulled into the conduit until the conduit is cleaned of all foreign matter.
- H. When installing parallel conductors, it is mandatory that all conductors making up the feeder be exactly the same length, the same size, and type of conductor with the same insulation. Each group of conductors making up a phase or neutral must be bonded together at both ends in an approved manner.
- I. MC cable or Romex cable will not be accepted unless specifically called for on drawings.
- J. Wiring thru light fixtures and receptacles will not be accepted.

#### **3.15. AUXILIARY GUTTERS (WIRING TROUGHS):**

- A. Auxiliary Gutters shall be sized per NEC to accommodate the installed number, size, and orientation of conductors and conduits.
- B. Conductors serving a gutter shall be extended without reduction in size, for the entire length of the gutter.
- C. All taps and splices shall be made with insulated multi-tap connectors.

#### **3.16. CIRCUITS AND BRANCH CIRCUITS:**

- A. Outlets shall be connected to branch circuits as indicated on the drawings by circuit number adjacent to outlet symbols, and no more outlets than are indicated shall be connected to a circuit.

#### **3.17. WIRE JOINTS:**

- A. Except for motor circuits, wire joints for #8 and smaller wire shall be made with twist on connectors.
- B. Wire joints and splices for motor circuits, for conductors #6 and larger, and for smaller conductors where other connectors are not rated for the number of conductors involved shall be made with split bolt connectors rated for the applicable conductor size, number of conductors, and conductor material.
  - 1. Properly tape and insulate all joints to attain the same insulation rating as the cable insulation.
  - 2. Splices for #6 through #1 shall have a minimum of two (2) layers of rubber tape covered by a minimum of three (3) layers of electrical tape.
  - 3. Splices for #1/0 and larger conductors shall have a minimum of two (2) layers of electrical filler tape covered by a minimum of three (3) layers of electrical tape.
- C. Splices in control conductors shall be avoided as much as possible. Stranded control conductor up to #12 may be connected or spliced with hand crimped type compression connectors. The connectors shall be of the proper size for the conductors being connected.
- D. Splices and joints made with mechanical/hydraulic type compression connectors:

1. Connections and splices shall be made with connectors rated for the applicable conductor size and conductor material.
  2. Dies used shall leave the die number embossed in the connector. The Contractor shall provide the Engineer with the Manufacturer's connector and die chart prior to final inspection.
- E. Taps and splices in auxiliary gutters/troughs shall be made with insulated multi-tap connectors.
- F. Wire joints and splices made below grade shall be made with UL listed waterproof connectors, wire nuts, or splice kits.
- G. All joints and splices shall be made in junction boxes, wiring troughs, or conduit bodies sized per NEC.
- H. All connections to switchboards, panelboards, transformers, generators, ATS, or any other type electrical distribution type equipment shall be compression type fittings. Mechanical fittings will not be accepted in these applications.

### **3.18. STRUT SYSTEM FOR SUPPORT OF ELECTRICAL EQUIPMENT:**

- A. Strut Systems: Strut shall be utilized to rack exposed piping vertically or horizontally on walls and across slabs (where applicable). Strut may be utilized to support piping above ceilings, for support of equipment, and elsewhere as deemed appropriate.
1. Strut in conditioned spaces and above accessible ceilings shall be electro-galvanized.
  2. Strut installed outdoors, in mechanical rooms, and in other unconditioned spaces shall be hot-dipped galvanized.
  3. Strut installed in waste water treatment facilities, kitchens, dishwashing spaces, and labs shall be stainless steel.
  4. Strut fittings and hardware, including anchors, shall be same material as strut.
  5. Saw cut strut square, 6" minimum lengths. Strut on continuous runs of pipe shall be same length. File or grind burrs from saw cuts.
  6. After installation, electro-galvanized and hot-dipped galvanized strut shall be painted with two coats of zinc primer.

### **3.19. OUTLET BOX INSTALLATION:**

- A. General: The drawings indicate approximate locations only; determine the exact location at the building in view of all structural and architectural conditions. Obtain Architect's verification of final locations.
- B. Outlet boxes shall be sized per NEC to accommodate the installed number and size of conductors, wiring devices, and conduits.
- C. Ceiling and Wall Bracket Outlets: 4" octagonal boxes with plaster rings appropriate for finish surface.
- D. Typical boxes (for switches, receptacles and auxiliary systems): 4" square boxes ganged as required. Furnish with 3/4" plaster rings where employed in plaster, 1" tile covers where used in ceramic tile, 1" plaster rings where set in exposed concrete, and otherwise appropriate for surface and construction.
- E. Boxes in Exposed (or Thin-Coat Plastered) Masonry: Where conduit connections permit, employ solid flush-type, square-cornered, masonry boxes with turned-in device holders; otherwise employ typical box with 1-1/2" square-cut tile cover. .
- F. Multiple Outlet Floor Boxes:
1. Verify the exact location of the floor boxes with the Architect prior to rough-in.
  2. Set the boxes in accordance with the manufacturer's instructions.
  3. Boxes shall be set so that the box is flush with the finished floor; the boxes shall not cause a rise or fall in the floor.
  4. The power outlets shall be connected to the circuits indicated by the numbers next to the symbol.
  5. For Data outlets, install a 1" C. to above the nearest corridor ceiling..
- G. Boxes used with Exposed Conduit: 4" square utility boxes.

- H. Exterior Boxes: Cast-metal boxes, Crouse-Hinds Type FS or FD as appropriate. Make weatherproof with gasketed covers. Equal products by Appleton, Killark, O-Z/Gedney, or approved equal will be accepted.
- I. Boxes used with Recessed Lighting Fixtures in suspended acoustical tile ceilings:
  - 1. Provide a 4" square box with blank cover adjacent to each fixture or fixture group.
  - 2. Install a flexible metal conduit fixture "whip" from the box to the fixtures. The "whip" shall not be longer than 72".
  - 3. Attach the box to the underside of the structure above, in an accessible location, not more than 18" above the lay-in ceiling.
  - 4. Where structure is more than 18" above the ceiling, the boxes shall be supported from all-thread rods, strut, or a combination of rod and strut.
- J. Boxes in Dry Wall Construction:
  - 1. Outlet boxes shall be securely fastened in place.
  - 2. Outlet boxes installed in metal stud construction shall be supported by brackets screwed to studs. Clip on brackets shall not be accepted.
    - a. Where a single outlet box is installed adjacent to a stud, brackets may attach to a single stud with a brace against the back of the opposite wall. Use a bracket equal to Caddy Fasteners "H" Series.
    - b. Where outlets do not fall next to a stud or where more than one outlet is installed between studs use a metal bracket attached to both studs. Brackets shall be equal to Caddy Fasteners "SGB", "TSGB", or "RBS" series brackets.
    - c. Outlet boxes three gangs and wider shall be supported with support member screwed to the two adjacent studs. Brackets equal to Caddy Fasteners SGB or TSGB brackets may be used.
- K. Sectional type switch boxes at least 2-1/2" deep may be used instead of typical box (but not where dry wall finish is applied over masonry back-up and not where multi-gang devices occur).
- L. Outlets in unfinished masonry walls may be slightly adjusted upward or downward to suit masonry courses, provided outlets are mounted at uniform heights throughout the installation.
- M. Coordinate installation of outlet boxes in masonry walls with the masonry contractor to insure that boxes are flush with face of wall and grouted smooth around boxes such that covers, fixtures or devices install flush on face of wall.
- N. Where outlets at different levels are shown adjacent, install in one vertical line where possible. Avoid conflict with wainscot caps, splash backs and upper cabinets by adjusting height slightly up or down as directed.
- O. Back to back boxes shall be staggered with at least 3 inches between boxes.
- P. Back to back boxes in fire rated partitions shall have a minimum of 24" horizontal and/or vertical separation between them.
- Q. Backs of boxes three gang and larger installed in fire rated partitions shall be wrapped with self adhesive fire stopping tape.
- R. Locate switch outlets on the lock side of doors and so that the first switch in a single or gang installation is approximately 6" to 10" from the doorjamb. Verify door swings on Architectural Drawings.
- S. Dimmers shall be ganged together in accordance with the manufacturer's instructions where appropriate, but shall not be ganged with toggle switches.
- T. Coordinate carefully with appropriate trades the size and orientation (vertical, horizontal) of outlet boxes for thermostats, data outlets, fire alarm equipment, security equipment, and other control and communications outlets.
- U. Mounting Heights:
 

Confirm all mounting height with local codes and authorities prior to bid and adjust as required:

Switches, generally	48" A.F.F. to top of outlet
Safety switches	Center of Switch 48" A.F.F. or as required.
Receptacles, generally	16" A.F.F. to bottom of outlet

Receptacles over counters	Bottom of outlet 6" above countertops or 2" above backsplashes
Telephone Outlets	16" A.F.F. to bottom of outlet
Computer Outlets	16" A.F.F. to bottom of outlet
Television Outlets	16" A.F.F. to bottom of outlet or as indicated
Wall mounted exit and emergency lights	Bottom of fixture 7'- 6" A.F.F. or 12" below Ceiling whichever is lower
Thermostat	Top of outlet 48" A.F.F. or as noted by mechanical drawings.
Electric Water Coolers	Coordinate location with plumbing contractor to locate the receptacle(s) concealed within the EWC enclosure per manufacturer's installation instructions.

- V. Install blank coverplates on all unused power and auxiliary outlet boxes. Blank coverplates shall match other cover plates installed in the facility.
- W. Furnish blank plates, matching those on the other outlets in the same area, on TV outlets and other outlets installed for future use.

### **3.20. WIRING DEVICES:**

- A. Install wall devices vertically' unless otherwise noted, so that all devices of any given height will align exactly.
- B. Where boxes are not flush or square with the finished wall surface install wiring devices utilizing a leveler and retainer equal to Caddy #RLC or Steel City #SSF-SR.
- C. Plates shall be plumb and true with all four edges contacting wall surface.
- D. Mount receptacles with grounding terminals down.
- E. Do not install devices until plastering or other type wall covering has been completed; install ahead of painting work, but protect from paint spatter.
- F. Use screw terminal connections only.
- G. Do not gang dimmer switches with toggle switches.
- H. Each single or multi outlet receptacle, other than straight blade, 15 or 20 amp, 120 volts, NEMA 5-15R or NEMA 5-20R, shall be provided with matching cord plugs and a minimum of 8 feet of Type SOW cable matching the receptacle size and configuration.
- I. Pin and sleeve plugs for food service equipment shall be provided with a Type SOW cable connected to the equipment and plug of sufficient length to reach from the equipment to the plug with a minimum of 18" slack cord. Minimum length shall be 6 feet from equipment to plug.
- J. Provide "Kellums" type grips at the plug, cord connector, and for overhead support on all overhead cord connector drops.

### **3.21. OCCUPANCY SENSORS AND ASSOCIATED DEVICES FOR LIGHTING CONTROL:**

- A. Occupancy sensors and associated devices and circuiting shall be installed in strict accordance with the manufacturer's instructions.
- B. Wall, corner mounted sensors shall be mounted as close to the ceiling as possible on the manufacturer's corner mounting bracket.
- C. Power packs shall be mounted above the ceiling. Power packs shall be installed utilizing two(2) 4" x 4" x 2-1/8" deep boxes joined together using the nipple on the powerpack in accordance with the manufacturer's instructions. One of the boxes shall contain the power pack and control wiring and the other shall contain the power wiring.
- D. All control and power circuiting shall be in EMT conduit. Where the devices are not equipped with conduit connections the conduit shall be brought up as close as possible to the device and terminated with insulating bushings.

### **3.22. ELECTRICALLY POWERED EQUIPMENT AND CONTROLS:**

- A. Provide and install power circuits for all electrically powered equipment and controls.

- B. Heating, Ventilating, and Air Conditioning Control Wiring and Conduit:
  - 1. The electrical contractor shall be responsible for installing outlet boxes for flush mounted HVAC system thermostats in dry wall or masonry wall construction and, where called for on the plans, for surface mounted metallic raceway in finished areas. Extend  $\frac{3}{4}$ " conduit from the outlet to above nearest accessible ceiling and terminate horizontally. Refer to the Mechanical/HVAC plans for thermostat locations and coordinate exact type outlet required and orientation with the Mechanical/HVAC contractor.
  - 2. The Mechanical Contractor shall be responsible for the installation of all outlets and conduit for surface mounted devices in unfinished areas such as shops, warehouses, industrial facilities, etc.
  - 3. The mechanical contractor shall furnish and install all low and line voltage control wiring required for the temperature control and/or ventilation systems.
- C. Where Fire Alarm system duct mounted smoke detectors and HVAC shut down interface relays are provided, the Electrical contractor shall provide wiring from the smoke detectors to the HVAC shut down interface relay. All circuiting from the shut down relay to the HVAC controls and/or starters shall be provided and installed by the Mechanical/Controls contractor.
- D. The mechanical contractor shall furnish all motor starters for the temperature control and/or ventilation equipment unless otherwise indicated on the electrical plans or elsewhere in these electrical specifications. The electrical contractor shall install all motor starters, except for equipment with factory installed starters, for the temperature control and/or ventilation equipment.
- E. Where exhaust fans are supplied with field installed speed controllers, the Electrical Contractor shall provide all necessary circuiting to the fan/speed controller and between the fan and the speed controller.

### **3.23. DISCONNECTING MEANS:**

- A. Where required by the National Electrical Code and/or other applicable codes or authorities, or where indicated on the electrical plans, the electrical contractor shall furnish and install an approved disconnecting means for all electrically powered equipment and/or controllers for such equipment whether the disconnecting means is or is not shown on the electrical plans.
  - 1. The location, rating, and enclosure for the disconnecting means shall be as required by the National Electrical Code and/or other applicable codes or authorities.
  - 2. Manual motor starters with thermal overload protection may be used in lieu of safety switches for individual motors under 1 horsepower.
  - 3. Motor rated switches may be used for the disconnecting means when supplied of correct voltage, phase, amperage rating, and enclosure type.
  - 4. The disconnecting means shall be as manufactured by General Electric, Square D, Cutler Hammer, or Siemens.
- B. Where the disconnecting means shown on the electrical plans has a rating greater than the required code rating, the greater rating device shall be installed.
- C. An approved horsepower rated fusible safety switch shall be installed where the circuit overcurrent protection does not provide overload protection for the equipment served and where required to meet the equipment's listing requirements.
- D. Motor rated switches may be used as service disconnect switches when supplied with a padlockable, handle locking guard.
- E. Install an engraved phenolic nameplate on the front of each switch enclosure identifying the equipment served by the safety switch and source of power (i.e., panel name and circuit number). Plates shall be white with black lettering. The plates shall be permanently installed with stainless steel screws or stainless steel rivets.
- F. All disconnects installed in public areas or in areas readily accessible to the public shall be lockable and shall be furnished with a brass lock. Provide 10 keys for each lock. All disconnect locks furnished on the project shall be keyed alike.

### **3.24. DATA AND TELECOMMUNICATIONS SYSTEMS:**

- A. The Data/Telecommunications Contractor shall have a BiCSI certified technician on the job at all times that system installation and/or testing is taking place.
- B. All cables shall be installed by the Data/Telecommunications Contractor under the direct supervision of a BiCSI certified technician.
- C. Install a 1" conduit from each Data and Communications outlet box to above the nearest corridor ceiling and terminate with an insulating bushing. The conduit shall be run without pull boxes, junction boxes, or conduit bodies and no more than the equivalent of three(3) 90 degree bends.
- D. Each Data/TeleCommunications outlet shall have a Category 6 cable installed from each jack to the patch panel serving the area. Coordinate with drawings.
- E. Make all terminations at jacks and patch panel in accordance with industry standards.
- F. Cable installation:
  - 1. The rated cable pulling tension shall not be exceeded. Cable shall not be stressed such that twisting, stretching or kinking occurs. Cable shall not be spliced.
  - 2. Cable shall not be run through structural members or in contact with pipes, ducts, or other potentially damaging items.
  - 3. Placement of cable parallel to power conductors shall be avoided, if possible; a minimum separation of 12" shall be maintained when such placement cannot be avoided.
  - 4. All cables shall be terminated at both ends; no cable shall contain unterminated elements.
  - 5. Cable ties shall not be excessively tightened such that the transmission characteristics of the cable are altered.
  - 6. Cable bending radius shall be 1" minimum. Minimum bending radius shall not be exceeded during installation or once installed.
  - 7. Cables shall not come in contact with conduits, ceilings, lighting fixtures, ductwork, or water, sewer, or steam piping.
  - 8. Cables routed above suspended ceilings shall be neatly bundled and supported with J-Hook Hangars attached to the building structure a maximum of 4 feet on center at not more than 24" above the suspended ceiling or in cable tray.
    - a. Cables shall be bundled together with nylon cable ties at 3' o.c. Cable ties shall not be excessively tightened such that the transmission characteristics of the cable are altered.
    - b. Hangars shall be configured as required to attach to the structure, wall mounted, ceiling mounted, suspended from all thread rod, or supported on strut attached to the structure. Anchors attached to sheetrock shall not be acceptable.
    - c. Hangars shall be single or multiple tiered as required for the number of cables being supported.
    - d. At Corridor crossings or other locations where wall mounting is impractical hangers shall be double sided, single tier J-Hooks suspended on all-thread rods supported from the building structure or beam clamps at a maximum of 48" on centers.
    - e. No more than 32 Cat 6 cables shall be installed in 2" J-hooks.
  - 9. Cables shall not be installed such that J-hooks are deflected, or such that cables are pulled tight against conduit walls where they exit the conduit.
  - 10. Cat 5e cables shall not be bundled with, installed in j-hooks with, or installed in conduit with power circuiting, bell system circuiting, intercom system circuiting, or other auxiliary systems circuiting.
  - 11. Cables routed through finished spaces which do not have suspended ceilings shall be installed in conduit. Routing of any exposed conduit shall be coordinated with the architect.
  - 12. Above inaccessible ceilings, cables shall be installed in EMT conduits. Conduits shall be terminated at each end with insulating bushings. Each end of conduit shall be easily accessible.
  - 13. Maximum number of Cat 6 cables in an EMT conduit shall comply with NEC.
  - 14. On backboards cables shall be supported on "D" Rings at not more than 10" on centers. Cables shall be attached to the "D" rings in vertical runs with nylon tie wraps.
- G. Category 6 Cable Testing:

1. All category 6 circuits shall be tested using a test set that meets the Class II accuracy requirements of TIA/EIA TSB 67 standard, including the additional tests and test set accuracy requirements of ANSI/TIA/EIA-568-A-5.
2. Testing shall use the Basic Link Test procedure of TIA/EIA TSB 67, as supplemented by ANSI/TIA/EIA-568-A-5.
3. All metallic cable pairs shall be tested for proper identification and continuity.
4. All opens, shorts, crosses, grounds, and reversals shall be corrected. Correct color coding and termination of each pair shall be verified in the communications closet and at the outlet.
5. Horizontal wiring shall be tested from and including the termination device in the communications closet to and including the modular jack in each room.
6. Makes and model numbers of testing equipment shall be provided to the Engineer for approval prior to beginning installation.
7. Each Category 6 cable shall be tested in accordance with ANSI/TIA/EIA TSB-67 for Link Performance Verification.
8. Phone outlets with RJ11 terminations shall have a Cat 5e connector installed for testing. After testing and certification of the cable the cable shall be terminated on the telephone jack.
9. Each Pair of conductors in each cable shall be tested for the following:
  - a. Wire Map
  - b. Length
  - c. Attenuation
  - d. Near End Crosstalk Loss (NEXT): Tested from both ends of cables.
10. Any cable(s) not meeting the minimum standards of ANSI/TIA/EIA TSB-67 shall be removed and replaced.
11. Results of the tests for each cable shall be printed out with the name of cable as affixed to the cable and terminals on site.
12. A bound copy of all test results shall be provided to the Engineer and Owner prior to final inspection. The results shall be bound in protective sleeves in a three ring binder.

H. Optical Fiber Cables:

1. All optical fiber cable shall be installed in 1" EMT conduit. After installation, conduits shall be permanently labeled as containing fiber optic cable.
2. Innerduct may be installed from the horizontal runs of EMT down to the Data Racks.
3. Optical fiber cables shall not be spliced. Each cable shall be continuous from Patch Cabinet to Patch Cabinet
4. All Optical Fiber Cable shall be pulled with hand power only. Pulling tension shall not exceed the cable manufacturer's rating. Torsion shall be avoided by the use of a swivel at the cable end. While under tension, a minimum bend radius of 20 times the outside cable diameter will be maintained through the use of pulleys and sheaves where required. After pulling, no bend may have a radius, at rest, of less than 10 times the outside cable diameter.
5. Provide cable lubricant compatible with the cable sheathing material when pulling cable. Attach pulling fixtures to the cable strength members. When indirect attachments are used, match the grip diameter and length to the cable diameter and characteristics. When indirect attachment is used on cables having only central strength members, reduce pulling forces to ensure that fibers are not damaged from forces being transmitted to the strength member. During pulling of the cable, continuously monitor pull line tension and shall not exceed maximum tension given by the cable manufacturer. Mechanical stress placed upon the cable during installation shall be such that cable is not twisted or stretched. Provide cable feeder guide between cable reel and face of duct or conduit to protect and guide cable into the duct or conduit as it played off the reel. As the cable is played off the reel, carefully inspect for jacket defects. Take precautions during the installation to prevent the cable from being kinked or crushed and to insure that minimum bend radius is not exceeded at any time. When practicable, use the center pulling technique to lower pulling tension. Pull cable from center point of cable run towards the end termination points. Method may require cable to be pulled in successive pulls. When cable is pulled out of a



- manhole or handhole, protect cable from dirt and moisture by laying cable on a ground covering.
6. Each cable and conduit or inner duct is to be permanently labeled at each end with a unique cable number. In addition, labels shall be affixed to the cable and conduit/inner duct at every transition of a vault, hand hole, riser closet, or major pull box. For example, from Server Room to each building wing should be labeled as "FIBER-1, FIBER-2, FIBER-3 & FIBER-4 or some unique numbering scheme to identify each cable run.
  7. Termination Standards
    - a. The terminal ends of all fiber cable strands shall be field connectorized. The connectors shall be mounted on backboards and installed in enclosures called Fiber Integration Centers (FIC). Terminate both ends of all fibers within a fiber cable with SC style connectors.
    - b. Fiber Organizers: Fiber cables are to be terminated in fiber optic cable patch panels installed where indicated on the drawings.
    - c. Each enclosure shall be labeled with a machine made label with permanent black ink on a white background. Labels shall be in the format to identify each cable run as well as the fiber pairs of each run. Labeled shall be on the faceplate with the identifiers of the cables it contains.
    - d. Each fiber optic strand shall be labeled with a unique identifier at the SC coupler in the FIC. Connectors shall be labeled on the identifying sheets on the front of the FIC.
    - e. Connectors and Splices: Fibers ends are to be terminated in SC-type connectors with composite ferrules. They must be of the "polish and adhesive" type. All runs are to be solid length point to point with no breaks to the termination points.
    - f. At each end of the cable, sufficient slack (10-15 ') shall be left to facilitate reasonable future relocation of the FIC. Slack shall be mounted on walls or ladder racks according to direction.
  8. Testing
    - a. Before Installation each individual fiber in each cable shall be tested with an adjustable OTDR for length and transmission anomalies while on the reel before installation.
    - b. Perform test on 100 percent of the fibers of each circuit and repeat from the opposite end of each circuit. Field tests shall include as a minimum:
      - 1) Optical time domain reflectometer (OTDR) test at 850 nanometers, of the FO cable on the reel prior to installation. Calibrate OTDR to show anomalies of 0.2 dB as a minimum. Submit photographs traces to the Engineer.
      - 2) Scale of the OTDR trace shall be such that the entire circuit appears over a minimum of 80 percent of the X-axis.
      - 3) After installation, repeat the OTDR test in item 1) above. Replace cables that failed the test. Test new segment of cable to demonstrate acceptability. Submit photographs traces for each circuit to the Contracting Officer.
    - c. After Installation
      - 1) High-resolution optical time domain reflectometer (OTDR) tests shall be performed from one end of each fiber.
      - 2) All single mode and multi mode fiber strands shall be tested end-to-end for bi-directional attenuation at 850 nm and 1300 nm.
      - 3) Tests should be conducted in compliance with EIA/TIA-526-14, Method B, according to the manufacturer's instructions for the test set being utilized.
      - 4) Tests must ensure that the measured link loss for each strand does not exceed the "worst case" allowable loss defined as the sum of the connector loss, (based on the number of mated connector pairs at the EIA/TIA-568 maximum allowable loss of 1.0 dB per mated pair), and the optical loss (based on the EIA/TIA-568 maximum allowable loss of 3.75 dB at 850 nm and 1.5 dB at 1300 nm).
      - 5) Before termination, each fiber shall be tested with an adjustable ODTR for length, transmission anomalies, and end-to-end attenuation. Results are to be recorded and supplied to Engineer in the form of hard-copy printouts or photographs of screen traces.

- 6) After termination connectors shall be visually inspected for scratches, pits or chips and shall be reterminated if any of these conditions exist.
- 7) Each terminated fiber is to be tested for end-to-end loss. As above, results are to be recorded and supplied to the Engineer.
- 8) The maximum allowable attenuation for any splice or termination is 0.5 dB.
- d. Any fiber optic cable not meeting the minimum standards shall be removed and replaced or if it is determined that splices or terminations are at fault the splice or termination at fault shall be replaced.
- I. Labeling:
  - 1. Cat 6 Cables:
    - a. Each jack, Cat 6 cable, and fiber optic cable shall be labeled with an alpha/numeric identifier with a corresponding identifier on the punch down block and/or patch panel.
    - b. The number shall include the alpha/numeric patch panel name and the alpha/numeric patch panel port name where the cable is terminated.
    - c. Labels shall be installed at each end of Cat 6 cables where terminated.
    - d. A floor plan of the facility shall be provided showing outlet locations and cable identifiers for each cable and the location of all patchpanels with the corresponding identifiers.
  - 2. Fiber Optic Cables:
    - a. Each Fiber Optic cable shall be labeled with an alpha/numeric identifier.
    - b. Each fiber in a fiber optic cable shall be labeled with an alpha/numeric identifier corresponding to the cable number, the patch panel number, and fiber identifier (typically A through F for a six fiber cable).
    - c. Labels shall be installed at each end of cables where terminated and on each fiber of each cable at the point of termination.
    - d. A floor plan of the facility shall be provided showing all patch panels with the corresponding identifiers, and cable identifiers for each cable at each patchpanel.

### **3.25. LIGHTING FIXTURES:**

- A. The installation and support of all lighting fixtures shall be the responsibility of the Electrical Contractor.
- B. Lay out work as shown, and to provide attractive and efficient arrangement.
- C. Install fixtures level, plumb, and true with ceiling and walls, and in alignment with adjacent lighting fixtures.
- D. Provide adequate and substantial supports for fixtures in accordance with manufacturers' directions and as specified herein.
- E. A Re-lock system will not be accepted for installing lights.
- F. Wire grid mounted luminaries individually to junction boxes with flexible conduit not more than 6 feet in length. Individual flexible connections shall be 2 #14 and 1 #14 ground THHN in 3/8" flexible conduit. Ground wire shall be bonded at each end.
- G. Fluorescent fixtures with "U" lamps and fixtures with PL fluorescent lamps shall have all fixtures in a room installed with the lamps oriented in the same direction.
- H. Fixtures mounted in inverted "T" grids:
  - 1. For round fixtures or fixtures smaller in size than the ceiling grid, provide a minimum of four wires per fixture located within 4 inches of each corner of the ceiling grid in which the fixture is located. Do not support fixtures by ceiling acoustical panels. Fixtures shall be supported independent of the ceiling system or shall be supported by at least two metal channels spanning the grid system, and secured to, the ceiling tees. One support wire shall be attached to the center of the fixture or to each of the metal channels.
  - 2. Surface mounted fixtures:
    - a. Surface mounted fixtures installed on lay-in ceiling systems shall be supported independent of the ceiling system from the building structure with a minimum of two (2) 3/8", minimum, all-thread rods.
    - b. Install nuts and washers on inside and outside of the fixture housing to provide a rigid installation.

- c. Provide cross bracing as required such that fixtures have no lateral movement.
- I. All stems on fluorescent fixtures shall be installed as follows: (except fixtures with slide grip hangers) first and last stem in row in first knockout from end of fixture. One stem shall be installed between each two fixtures, stem shall center joint, where fixtures join, and attach by use of "jointing plates". Nipples with lock nuts and bushings shall connect all fixtures in continuous rows other than recessed grid type.
- J. All suspended lighting fixtures shall be provided with chain or cable sway bracing to keep fixtures from swinging.
- K. Fixtures installed in fire rated assemblies shall be tented in accordance with the specified assembly.
- L. Means shall be provided to keep insulation 4" minimum away from fixtures not rated for direct contact with insulation.
- M. Prior to final inspection clean fixtures and lamps with a soft cloth or sponge and detergent (not soap) solution.
- N. All fluorescent, induction or HID lighting fixtures installed in gymnasiums, hangars, high bay or similar use areas shall be equipped with wire guards.
- O. All emergency and exit lights designated on drawings shall be provided with an 1100-lumen battery ballast.
- P. All light fixtures shall be supported to the structure independent of the ceiling system on two opposite sides. Support wires shall be different color from ceiling support wires. Engage all ceiling mounting clips. If light fixture is not provided with grid support clips, then the contractor will be responsible to support the fixture on all four sides with support wires. See "Typical Lay-In Luminaire Detail" on drawings for further requirements.

### **3.26. WOOD POLE SETTING:**

- A. Wood poles shall be set in accordance with REA Bulletin 50-3(D-804). Minimum pole setting depth shall be ten (10) percent of the pole length plus two (2) feet.
- B. Holes shall have 3" clearance all around poles for compacting backfill material.
- C. Poles shall be set plumb.
- D. Backfill shall be free of rocks, gravel, roots, and other foreign material.
- E. Backfill shall be free of rocks, gravel, roots and other debris and shall be tamped in lifts of no more than 4" with water added as required to facilitate compaction.
- F. Loose poles shall be reset or backfill material removed and recompact.

### **3.27. CONCRETE POLES:**

- A. The concrete poles shall be set in the ground a minimum of 4 feet and shall be set such that the top of the conduit/conductor entrance is 12" below grade.
- B. Holes shall have 3" clearance all around poles for compacting backfill material.
- C. Poles shall be set plumb.
- D. Poles shall be set with the center of the poles 18" from the edge of the paved walking trail with the front edge parallel or tangent to the edge of the trail.
- E. The two conduit/cable entrances shall be parallel with the edge of the walking trail.
- F. Handholes shall all be set to the same side relative to the walk.
- G. Backfill shall be free of rocks, gravel, roots and other debris and shall be tamped in lifts of no more than 4" with water added as required to facilitate compaction.
- H. Provide ample backfill for settling.
- I. Poles shall be installed with a leveling jig.
- J. Loose poles shall be reset or backfill material removed and recompact.
- K. Poles which become noticeably crooked during the first year of installation shall be replaced.

- L. Poles which become noticeably out of plumb shall be straightened at no expense to the owner for a period of one year.

### **3.28. PANELBOARDS:**

- A. Panelboards shall be installed where shown on the drawings.
- B. Ratings and configurations shall be as scheduled and/or indicated on the drawings.
- C. The Electrical Contractor shall coordinate installation of equipment in Electrical and Electrical/Mechanical spaces with other trades such that Code required clearances and working space around the electrical equipment is maintained.
- D. Conduit termination:
  - 1. In general use panelboards with blank ends, without knockouts.
  - 2. Layout conduit entries carefully to allow clearances for drywall or CMU wall thickness, and to accommodate the number and sizes of home run conduits and specified spare conduits.
  - 3. Use Greenlee Knock-Out punch, or equal, to cut holes in panelboard ends and/or sides for conduit installation. Do not drill holes, or cut holes out with snips or torch.
- E. Phase arrangement in panelboards shall be per the NEC, phase A, B, C from front to back, top to bottom, or left to right as viewed from the front.
- F. Multi-Section Panelboards:
  - 1. Sub-feed conductors shall be the same size as the conductors feeding the main section.
  - 2. Circuiting originating in one section shall not pass through another section.
  - 3. Circuit conductors and grounding conductors shall originate in the same panelboard section.
  - 4. A separate isolated grounding conductor shall be installed from the main section to the sub-feed section(s).
  - 5. Where the panelboard is rated for service entrance equipment the each sub-feed section shall have a separate isolated ground buss fed from the main section ground buss.
- G. Labeling:
  - 1. Each panelboard shall have an engraved phenolic plate permanently installed on the front of the panel with the panel name, current rating, and voltage rating.
  - 2. Where there is more than one nominal voltage system the panel shall also have an engraved phenolic plate describing the means of identification used to identify the phase and system of each ungrounded conductor of the system served by the panel.
  - 3. Plates shall be white with black lettering.
  - 4. Panelboard circuit numbers shall be as indicated on the panelboard schedules.

### **3.29. PHOTOELECTRIC CELLS, TIMERS, AND CONTACTORS FOR LIGHTING CONTROL:**

- A. Install time clocks where accessible.
- B. Install photoelectric cells so that lighting fixtures do not affect the cell.
- C. Adjust time clock(s) and photoelectric cells as required for proper operation.

### **3.30. IDENTIFICATION AND LABELING:**

- A. Feeder Designation:
  - 1. Non-ferrous identifying tags or pressure sensitive labels shall be securely fastened to all cables, feeders, and power circuits in vaults, pull boxes, manholes, switch gear and at termination of cables. Tags or labels shall be stamped or printed to correspond with markings on drawings so that feeder or cable number and phase can be readily identified.
  - 2. Where there is more than one nominal voltage system, each ungrounded system conductor shall be identified by phase and system wherever accessible per NEC. The means of identification shall be permanently posted at each branch-circuit panelboard.
- B. Color Coding of Conductors:
  - 1. The ungrounded (phase) conductors and the grounded (neutral) conductors of each voltage system shall be identified by the following color coding method:
    - d. 120/208 Volts, 3 Phase, 4 Wire:
      - 1) Grounded (neutral) Conductor --- White

- 2) Ungrounded (phase) Conductors --- Black, Blue, Red
  2. Green shall be used for equipment grounding conductors only.
  3. The insulation color shall be visible for the entire length of wire.
- C. Panelboard:
1. Each Lighting and Power Panelboard shall contain a typed circuit directory listing all circuit breakers and the load served by each.
  1. Panelboard directories shall be typewritten, and shall include adequate descriptions for proper identification of individual circuits. Do not write in or on panelboards.
  2. On Distribution panelboards, provide and install an engraved laminated label for each circuit, indicating circuit's number and load served.
  3. Each panelboard shall have an engraved phenolic plate permanently installed on the front of the panel with the panel name, current rating, and voltage rating.
  4. Where there is more than one nominal voltage system each panelboard shall have an engraved phenolic plate describing the means of identification used to identify each phase, neutral, and grounding conductors of the system served by the panelboard per NEC.
  5. Plates shall be white with black lettering.
- D. Wall Switches: Where three or more switches are ganged, and elsewhere as indicated, identify each switch with approved legend engraved on the wall plate.
- E. Receptacles: Install a label on the face of the coverplate and tags or wire markers inside the outlet box identifying the panelboard and circuit number from which the outlet is served. Use machine-printed, pressure-sensitive, abrasion-resistant label tape on face of coverplate- black print on clear tape on light colored or stainless steel plates and white print on clear tape on dark colored plates. Embossed tape labels will not be accepted. Use durable wire markers or tags within outlet boxes.
- G. Disconnect Switches:
1. Install an engraved phenolic nameplate on the front of each switch enclosure identifying the equipment served by the safety switch and source of power (i.e., panel name and circuit number).
  2. Plates shall be white with black lettering.
  3. The plates shall be permanently installed with stainless steel screws or stainless steel rivets. Plates installed with glue or other adhesives will not be accepted.
  4. Where motor rated switches are used as service disconnect switches, labeling shall be as described for receptacles.
- H. Junction boxes: Identify circuits enclosed in concealed junction boxes on the cover with permanent marking pen.
1. For power and lighting circuits indicate panelboard of origin and panelboard circuit number(s).
  2. For auxiliary systems circuiting indicate the system and zone served.
- I. Service disconnects:
1. An additional engraved sign shall be permanently attached next to panelboard circuit breakers, on enclosed circuit breaker enclosures, and/or on disconnect switches used as service disconnects to identify each main service disconnect.
  2. The sign shall be red with white lettering a minimum of ½" high.
  3. Where multiple main disconnects are utilized the labels shall identify each as one of a group, i.e., "Service Disconnect 1 of 3", etc. where there are three service disconnects.

### **3.31. FIRE ALARM SYSTEM:**

- A. The installation shall be by a Certified Fire Alarm Contractor who has qualified and received a permit from the State Fire Marshal, with an NICET Level III on staff.
- B. All wiring shall be in accordance with the National Electric Code and the local code having jurisdiction.
- C. Unless otherwise specified, minimum wire size shall be 14 gauge for AC and power supply connections, 14 gauge for audible alarm and auxiliary circuits, and 18 gauge for signal initiating

circuits. Diagrams shall be provided for device and power wiring. Color coding and permanent numbering shall be used as recommended by the equipment supplier.

- D. All system wiring shall be installed in metal raceway in accordance with Section "Raceways".
- E. Junction boxes shall have covers painted red with the letters "FA" stenciled on the cover in 2" high white letters.
- F. Auxiliary Remote Power Supplies/Notification Appliance Circuit Extender (NAC panel):
  - 1. Power supplies shall be sized at 133% of proposed load. Fire Alarm submittals shall include power supply capacity and loading data.
  - 2. Remote power supplies shall be supervised by the FACP.
  - 3. The power supplies shall be installed, accessible, below ceiling, in electrical rooms or where indicated on the drawings.
- G. Provide circuiting as required for the interface with the kitchen hood fire suppression system and the fire alarm system.
- H. Where air handler shut down is controlled from the fire alarm system, the fire alarm system installer shall provide circuiting as required between the Duct Mounted Smoke Detectors and the HVAC interface/shut down relays. Circuiting connecting the relay output contacts to the HVAC control system shall be provided and installed by the Mechanical/Controls contractor.
- I. Each air handling unit shall be a separate fire alarm initiating zone.
- J. Install wire guards on all smoke detectors and notification devices installed in gymnasiums or similar use areas.
- K. Install telephone cable(s) in conduit from the FACP to the Telephone Backboard as required for connection of the FACP to the telephone system.
  - 1. Terminate the conduit on the TBB with an insulating bushing.
  - 2. The FACP shall be connected to two telephone lines per Code.
  - 3. Coordinate the connection of the Fire Alarm System to the telephone system and verify proper communications.
- L. Final connections to the Fire Alarm Control Panel **and Voice Panel** shall be made by a factory certified, NICET Level III, technician.
- M. A factory-trained representative of the manufacturer shall supervise connections and final testing of this system and shall complete a Certificate of Completion per NFPA 72. The Certificate of Completion shall be completed and copies delivered to the Owner, Architect, and Engineer prior to the final inspection.
- N. On completion of the acceptance tests, the Owner or his representative shall be instructed in the operation and testing of the system.
- O. The fire alarm system shall be warranted free from defects in workmanship and materials, under normal use and service, for a period of one year from the date of acceptance or beneficial occupancy, whichever is earlier. Any equipment shown to be defective in workmanship or material shall be repaired, replaced, or adjusted free of charge.
- P. Identification and labeling:
  - 1. Provide a framed building drawing identifying each zone and/or building area.
  - 2. Each building zone on the Fire Alarm Control panel shall relate to the building drawing in a manner that will direct the fire department to the area of a fire.
  - 3. On addressable systems each addressable device shall be given a name displayed on the control panel readout that will direct the fire department to the area of the fire, i.e. – South End of Zone(Building) 5; AHU-1 – Mechanical Room 201 – Building 2. Any room number reference shall be to final room numbers assigned to rooms on completion of construction.
  - 4. Building drawing, schedule of zones, and device identification schedule shall be submitted to the Engineer for approval prior to final inspection and acceptance.
  - 5. On addressable systems the contactor shall label each device with an alpha-numeric identifier that is unique to that device. This identifier shall correspond to the identifier programmed in the fire alarm control panel such that maintenance personnel may quickly and readily identify the device.

### **3.32. SECONDARY SURGE ARRESTERS:**

- A. Secondary surge arresters shall be installed in strict accordance with the manufacturer's recommendations.
- B. Arrester may be mounted to the side of a surface mounted panelboard or trough. If such a surface is not available, the arrester shall be mounted on a bracket in its own flush mount enclosure located immediately adjacent to the service panel. Insure that all leads are attached per manufacturer's recommendations. Excess lead length shall be cut off prior to making connections.

### **3.33. CONCRETE:**

- A. The Electrical Contractor shall be responsible for placing concrete for electrical equipment pads, lighting standard bases, electrical equipment supports, and at other locations as indicated on the electrical drawings and/or specified herein.
- B. This Contractor shall be responsible for size, location, and orientation of the pads, bases, etc. Any required additions or modifications to concrete due to incorrect size, location, or orientation shall be the responsibility of this contractor.
- C. Concrete shall be cured for a period of not less than seven (7) days prior to setting poles, transformers, switchgear, motor control centers, or other pad mounted equipment.
- D. Forms shall be completely removed after concrete has cured and prior to setting equipment.
- E. A smooth wood float finish shall be given to exposed, unformed concrete.
- F. Honeycombed, or otherwise defective areas of concrete shall be repaired by patching with cement mortar.

### **3.34. INTERCOM SYSTEM:**

- A. Coordinate the locations of ceiling speakers with lighting fixtures and HVAC system devices and as close to where indicated as possible. Speaker baffles shall be pulled up tight against the ceiling tiles.
- B. Install Call-in switches in single gang outlet boxes where indicated on the plans.
- C. A cable must be run from each speaker to intercom control panel where shown. Cables shall be run in conduit.
- D. Cables shall be routed in EMT conduit from speaker outlets to above corridor ceiling.
- E. Cables above corridor ceilings:
  - 1. Cables shall be neatly bundled and supported with J-Hooks attached to the building structure a maximum of 4 feet on center.
  - 2. Intercom cables shall be installed on J-Hooks separate from all other auxiliary systems cables.
  - 3. Cables shall not come in contact with conduits, ceilings, lighting fixtures, ductwork, or water, sewer, or steam piping.
- F. Above inaccessible ceilings, cables shall be installed in EMT conduits. Conduits shall be terminated at each end with insulating bushings. Each end of conduit shall be easily accessible.
- G. Cables routed through finished spaces which do not have suspended ceilings shall be installed in conduit. Conduits shall be concealed above ceilings or in hollow spaces if possible. Routing of any exposed conduit shall be coordinated with the architect.

### **3.35. SPARE PARTS:**

- A. Provide one spare set of fuses for each size and type fuse used.
- B. For fire alarm systems provide one spare unit of each type initiating and notification device for every 50 devices installed, providing a minimum of one of each type device.

### **3.36. EQUIPMENT TOUCHUP AND PAINTING:**

- A. Clean damaged and disturbed areas on all painted surfaces of enclosures, cabinets, and equipment, sand smooth, and apply primer, intermediate, and finish coats of paint to suit the degree of damage at each location. Paint shall be the manufacturer's supplied touch up paint or

a matching paint. Prep all surfaces to be painted by removing all rust, dirt, oil, and any other material that might inhibit good paint adhesion by mechanical means and/or with solvents.

- B. Follow paint manufacturer's written instructions for surface preparation and for timing and application of successive coats.
- C. Repair damage to galvanized finishes with two coats of zinc-rich paint recommended by manufacturer.
  - 1. Paint cut ends.
  - 2. Paint all drilled and punched holes.
  - 3. Paint all knicks and scratches.
  - 4. Paint all field cut conduit threads.
- D. Repair damage to PVC or paint finishes with matching touchup coating recommended by manufacturer.

END OF SECTION