

# Project Manual:

## New Theater Building Dressing Room/Restroom Remodel 536 North 7<sup>th</sup> Street Terre Haute, Indiana 47809

Owner/Project Manager:



**Indiana State  
University**

Department of Facilities Management  
951 Sycamore Street  
Terre Haute, Indiana 47809  
812-237-8100

Electrical/Technology Designer:



**R.E. Dimond**  
and Associates, Inc.  
Consulting Engineers  
732 North Capitol Avenue  
Indianapolis, IN 46204

PHONE: (317) 634-4672 FAX: (317) 638-8725

**Bid Number B0028532**



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NOTICE TO BIDDERS

Sealed proposals are requested for the New Theater Building Dressing Room/Restroom Remodel, Bid Number B0028532. Proposals will be received for the above contract at the Office of the Department of Purchasing, Indiana State University, Facilities Management and Purchasing Building, 951 Sycamore Street, Terre Haute, Indiana 47809, until 2:00pm Local Time, February 18, 2025. There will be no in person Public Bid Opening. The Bids will be opened at 2:15pm on the due date and read aloud via Teams conference call. For conference call access call 812-228-8187 and enter conference ID 104 373 296 followed by #.

Bidding Documents may be downloaded from the ISU Plan Room at <http://www.indstateplanroom.com/> on January 31, 2025 for \$5.50 per person/download which covers all downloads for that particular Project. Bidders must register for a free account the first time they access the website. Bid Documents may be ordered for purchase on CD, for \$7.50 per CD, or on paper copy at applicable printing costs from Rapid Reproductions, Inc., 129 South 11<sup>th</sup> Street, Terre Haute, IN 47807 (812-238-1681 Toll Free 800-736-7084).

Proposals are to be made on the Bid Form published in the Project Manual, based on Form 96 (Revised), as prescribed by the State Board of Accounts. As a mandatory requirement the Proposal shall be accompanied by a certified check; cashier's check or a Bid Bond (AIA A310) for an amount not less than 5% of the total bid price for Base Bid(s) and all add Alternates. See Section 00 10 10 Instructions to Bidders 3.01 for Bid Bond Requirements

Bidder(s) receiving awards shall be required to provide acceptable surety in the form of a Performance and Labor and Materials Payment Bond for the full amount of the award. Include the cost of all bonds and insurance in the Bid amount.

Indiana State University is a Tax Exempt Institution and Indiana Sales Tax for products permanently incorporated in work shall not be included as part of the Bid or on any Application for Payment.

All Bidders must comply with All State and Federal Non-Discrimination laws.

Responsive bidders may not have an active dispute, claim, or litigation with Indiana State University.

Indiana State University reserves the right to accept or reject any Bid and to waive any irregularities in Bidding. Any proposal received after the time fixed herein shall be returned unopened.

No bid may be withdrawn after the opening of Bids without the consent of Indiana State University for a period of One Hundred Twenty (120) days after the time of opening Bids.

There will not be an actual Pre-Bid conference meeting for the Project. A copy of a Pre-Bid Information sheet will be included with the Bidding Documents. Bidders shall review the information sheet and the contained information will become a part of the Bidding Documents.

Pre-Bid site visits have been scheduled at 10:00am on February 6, 2025 at the New Theater Building main lobby, 536 North 7<sup>th</sup> Street, Terre Haute, Indiana 47809. While masks are not required on the ISU campus or in campus buildings attendees are reminded to practice social distancing whenever possible. *Representatives of each of the Bidders are strongly urged to attend.*

Contract Award shall be to a Single Prime Bidder for all single Base Bid project work or the Contract Award may be to multiple Single Prime Bidders for multiple Base Bid Package project work. The prime Bidder(s) shall be an experienced and qualified Contractor(s) having successfully completed a minimum of three (3) projects of similar size and scope. The Bid form for this Project requires the Bidder to submit evidence of successful installation of similar projects (minimum of three projects), including customer information, scope, dates, Contract dollar amounts. With their Bid the Bidder shall submit their most current audited financial statement and vendor trade credit references as evidence of financial capability to perform the work.

00 10 00  
NOTICE TO BIDDERS

**All questions relating to this Project shall be addressed to:**  
**Scott Tillman ISU Department of Facilities Management**  
**Phone 812-237-8198 E-mail [scott.tillman@indstate.edu](mailto:scott.tillman@indstate.edu)**

INDIANA STATE UNIVERSITY BOARD OF TRUSTEES

By: Diann E. McKee  
Senior Vice President for Finance and Administration and University Treasurer  
Indiana State University

END OF SECTION 00 10 00

00 10 10  
INSTRUCTIONS TO BIDDERS

PART 1- INSTRUCTIONS TO BIDDERS

1.01 GENERAL

- A. Bidders shall carefully read the Notice to Bidders with regard to preparation of proposals, which includes the date and place for receiving proposals. See PART 3 of this Section 00 10 10 Instructions to Bidders for a complete list of the required forms for Bidding.
- B. All Bidders shall fully inform themselves of the conditions under which the work is to be performed, the site of the work, the obstacles that may be encountered, and other relevant matters concerning the work to be performed.
- C. The Contractor shall begin Work within seven (7) days after with all Work substantially completed by May 16, 2025. Final closeout shall be within thirty (30) calendar days thereafter. A warranty walk-thru may be held eleven (11) months from the date of substantial completion.
- D. No Bidder, after being awarded the contract, shall be allowed any extra compensation for reason of their failure to fully inform themselves, prior to their Bidding, of all requirements of the Contract Documents, the Drawings, and Specifications.
- E. If any Bidder for the proposed contract is in doubt as to the true meaning of any part of the Drawings, Specifications or their proposed Contract Documents, they may submit to the Owner written request for any interpretation thereof. The Bidder submitting the request will be responsible for its prompt delivery. Any interpretation of the proposed documents will be made only by an Addendum duly issued. A copy of such Addendum will be posted to the ISU Plan Room and e-mail notification sent to each registered plan holder (see 1.07 of this Section). Such Addendum, if any, issued before submission of the Bids, shall be taken into account and included in the proposal.
- F. Any Bidder may withdraw their Bid at any time prior to the scheduled time for the receipt of bids.
- G. No Bidder may withdraw their Bid or proposal for a period of One Hundred Twenty (120) calendar days after date and time set for opening Bids.
- H. It is understood that the Owner reserves the right to waive any irregularities in Bidding and to accept or reject any or all Bids.
- I. It is further understood on Bids with multiple Bid Packages the Owner reserves the right to selectively Award individual Bid Packages to multiple Prime Bidders submitting the lowest and best Bids for the individual Bid Packages.

1.02 EXAMINATION OF SITE AND BIDDING DOCUMENTS

- A. The site shall be carefully examined prior to bidding to ascertain the location of the work, existing conditions, and all other matters which may affect the work under this Contract. Each Bidder by making their Bid represents that they have visited the site and familiarized themselves with the local conditions under which the Work is to be performed.
- B. The Bidding Documents shall be carefully examined to ascertain the character, quality and quantity of the work to be performed, of materials and items to be furnished, of equipment and facilities needed during construction, of utilities and of all other matters which may affect the work under the Contract. Each Bidder by making their Bid represents that they have read and fully understands the Bidding Documents.

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INSTRUCTIONS TO BIDDERS

1.03 PRE-BID CONFERENCE

- A. There will not be an actual Pre-Bid conference. A pre-bid site visit will be held to allow Bidders' to visit the site. All questions, even if asked and answered at the pre-bid site visit, shall be submitted in writing via e-mail to the Project main contact and Owner.
- B. An Addendum will be issued confirming any information conveyed at pre-bid site visit and no verbal response tendered during pre-bid site visit shall have legal standing unless so confirmed by Addendum.
- C. Additional site visits may be arranged with the Project's Main Contact or Owner's Main Contact.

1.04 BIDDING QUESTIONS

- A. Questions regarding the Bidding Documents and Project shall be submitted in writing via e-mail to the Project main contact and Owner. An Addendum will be issued to respond to all questions received. No verbal or direct e-mail response shall have legal standing unless so confirmed by Addendum.
- B. The last day for questions to submitted shall be three (3) business days prior to the scheduled date for the receipt of Bids. Any questions submitted after that date may not receive consideration.

1.05 EXECUTION OF AGREEMENT

- A. For all Projects the forms of agreement which the successful Bidder, as Contractor, will enter into will be an ISU Award Letter, an ISU Purchase Order and a Contract for Construction. Prior to issuance of the Purchase Order the Contractor shall provide to the Director of Purchasing the Labor and Material Performance Bond, their most current financial statement and vendor trade credit references as evidence of financial capability to perform the work and the policies of insurance or insurance certificates as required by the Contract Documents and listed in the Award Letter. All Bonds and Insurance shall have an A.M. Best rating of not less than an "A". Once all the required paperwork has been received by ISU Purchasing and the Purchase Order issued, an electronic PDF copy of the Contract for Construction Between Indiana State University and Contractor, will be e-mailed to the Contractor for their signature and return to the Department of Facilities Management Contract Administrator for forwarding to the Senior Vice President for Finance and Administration for Owner signature. A fully executed copy of this Contract will be returned to the Contractor via e-mail for their files.
- B. Time Limits for Execution of Agreement.
  - 1. The successful Bidder shall supply the required paperwork (their Financial Statement (if not supplied with their Bid), Certificate of Insurance and their Performance and Payment Bond) to the ISU Purchasing Department within ten (10) calendar days after receipt of the ISU Award Letter.
  - 2. The successful Bidder shall within seven (7) calendar days after receipt of the Contract for Construction Between Indiana State University and Contractor enter into the written Contract to perform the work in accordance with the Drawings and Specifications by signing and returning the Contract to the Department of Facilities Management Contract Administrator for forwarding to the Senior Vice President for Finance and Administration for Owner's signature and return to the Bidder.
- C. In the case a Bidder whose Bid is accepted, fails to perform their Bid by providing the required paperwork within ten (10) calendar days after receipt of the Award Letter and entering into the written Contract with the Owner within seven (7) calendar days after receipt, then this failure may be cause for their certified check, draft or Bid Bond, and the proceeds thereof, to remain the absolute property of the Owner, as liquidated damages, it being impossible to estimate the amount of damages such failure would occasion.



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INSTRUCTIONS TO BIDDERS

1.06 INDEMNIFICATION

- A. Bidders, in consideration of the privilege of Bidding, specifically waive all rights both legal and equitable which they have or might be construed to have against Indiana State University because of any action taken in accepting or rejecting bids and proposals, for themselves, and /or for subcontractors, suppliers and/or manufacturers, who may file an action based on any such acceptance or rejection. Bidders shall be liable for any resultant reasonable attorney fees and expenses incurred by Indiana State University.

1.07 ADDENDA

- A. All Addenda for the Project will be posted on the ISU Plan Room at: <http://www.indstateplanroom.com/>. Addenda may be downloaded at no cost to registered plan holders.
- B. A Bidder must register for a free account the first time they access the ISU Plan Room website.
- C. The Bidder will receive an e-mail notifying that an Addendum is available for download from this site. The Bidder is advised to periodically check this link in the event an e-mail fails to deliver.

1.08 SUBSTITUTIONS PRIOR TO BID

- A. Requests for substitution of any material, construction, equipment and methods named or described in the Specifications, on the Drawings and any Addenda issued shall be submitted in writing to the Architect/Engineer and Owner a minimum of seven (7) calendar days prior to Bidding. Complete support documentation shall be provided that the item to be substituted is equal to or exceeds the material, construction, equipment or methods named or described in the Specifications, on the Drawings and any Addenda issued with the request for substitution. It is solely at the discretion of the Architect/Engineer and the Owner to allow any requests for substitution.
- B. Should it be determined after Award of the Bid that the Bidder based their Bid on any material, construction, equipment and methods not named or described in the Specifications, on the Drawings and any Addenda issued as approved for substitution prior to Bidding shall be disallowed and the material, construction, equipment and methods named or described in the Specifications, on the Drawings and any Addenda issued shall be provided at no additional cost to the Owner.

PART 2 - SUBCONTRACTORS, SUPPLIER AND MANUFACTURER'S BIDS TO BIDDERS

2.01 SUBCONTRACTOR, SUPPLIER AND MANUFACTURE BUNDLING OF PRICES TO PROSPECTIVE BIDDERS

- A. Subcontractors, Suppliers and Manufacturers are permitted to bundle quote prices to Bidders however these bundled prices may not be used to withhold providing individual pricing to a Bidder for bundled items when requested by a Bidder to provide individual pricing. No subcontractor or supplier shall make it a condition of their bid that another part of the project be awarded to them.
- B. Failure to provide individual pricing upon Bidder's request may be cause to disqualify a Subcontractor or Supplier and Manufacturer from Indiana State University Projects.

PART 3- EXECUTION FORMS FOR BIDDING

3.01 BID BOND

- A. A certified or cashier's check or Bid Bond is a mandatory requirement to be submitted with the Bid and shall be based on not less than five (5) percent of the Bid amount total of the Base Bid(s) and all add Alternates.
- B. The Bid bond shall be in the form prescribed by the Contract Documents except as provided otherwise by Laws or Regulations, and shall be executed by such sureties

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INSTRUCTIONS TO BIDDERS

as are named in the list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. The Bid Bond shall be obtained from surety or insurance company that is duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds or insurance policies for the limits and coverages so required. In addition to appearing on Circular 570 U.S. Dept. of the Treasury, such Surety or insurance company shall maintain an A.M. Best's Rating of not less than "A.

- C. Failure to submit an acceptable Bid Bond with the Bid shall disqualify a Bidder.

3.02 BIDDERS FINANCIAL STATEMENT

- A. With their Bid the Bidder shall submit their most current independently audited or reviewed financial statement and vendor trade credit references as evidence of financial capability to perform the work.
- B. Failure to submit the Bidder's financial statement may be cause to disqualify a Bidder.

3.03 CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION (SECTION 00 10 20 OF PROJECT MANUAL)

- A. This certificate is required by the regulations implementing Executive Order 12549 Debarment and Suspension, 34 CFR Part 85, Section 85.510, Participants' responsibilities. The regulations were published as Part V11 of the May 26, 1988 Federal Register (pages 19160-19211).
- B. Submit at time of Bid. Failure to submit with the Bid may be cause to disqualify a Bidder.

3.04 MBE/WBE/VBE PARTICIPATION PLAN. (SECTION 00 10 40 OF THE PROJECT MANUAL)

- A. See Section 00 10 30 MBE/WBE/VBE COMPLIANCE INSTRUCTIONS for full details on submission of the Participation Plan.
- B. This Plan must be submitted at time of Bid by **all Bidders**. Failure to submit with the Bid may be cause to disqualify a Bidder.

3.05 MANDATORY TIER II REPORTING REQUIREMENT FOR PROJECTS EQUAL TO OR GREATER THAN \$150,000.00. (Note: this form may not be included in all Project Manuals)

- A. MBE/WBE/VBE utilization in the performance of this Contract must be reported with each Application for Payment using the ISU Business Diversity Spend Reporting Form for Construction/Renovation/Facilities Repair Projects (see included: Tier II Spend Report Form.xlsx.)
- B. Compliance with Owner's Mandatory Tier II Reporting Requirement is a condition for the approval of an Applications for Payment.
- C. An electronic copy in Excel format will be included with the Award Letter when applicable.

3.06 BIDDER'S CERTIFICATION OF AUTHORIZED EMPLOYMENT (SECTION 00 10 45 OF THE PROJECT MANUAL)

- A. Bidder must certify at time the of Bidding that they have read and understand the "Contractor's Certification of Authorized Employment" provision of the Contract Documents In Section 00 20 11 Amendments to General Conditions Article 13, subparagraph 13.1.7.3 and its subparagraphs
- B. Submit at time of Bid. Failure to submit with the Bid may be cause to disqualify a Bidder.

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INSTRUCTIONS TO BIDDERS

3.07 BID FORM (SECTION 00 20 00 OF THE PROJECT MANUAL)

- A. In order to receive consideration, make all Bids in strict accordance with the following:
  - 1. Proposals shall be submitted only on the form furnished, a copy of which is bound into and forms a part of this Project Manual, and which will become a part of the Purchase Order Contract of the successful Bidder (use a photocopy of the Bid Form herein).
  - 2. Proposals shall be completely and correctly filled out using ink or typewriter, with signatures in ink.
  - 3. Prices, except unit prices and percentages, shall be stated both in figures and in writing. In the event of a discrepancy between writing and the figures, the written amount shall govern.
  - 4. Proposals shall be signed by the Bidder, by a partner, or a duly authorized officer for a corporation, and shall give the Bidder's business address and telephone number. Failure to sign the Bid form may be cause to disqualify a Bid.
  - 5. Proposals submitted by non-Indiana corporations shall be accompanied by a certificate of existence issued by the Indiana Secretary of State.
  - 6. Any interlineation, alteration or erasure of the published Bid Form may be grounds for rejection of the proposal. Proposal shall contain no recapitulation of the work to be done.
  - 7. Proposals shall be based only on the material, construction, equipment and methods named or described in the Specifications, on the Drawings, and any Addenda issued prior to Bidding. See item 1.08 of this Sections for substitution request requirements.
- B. Modification of proposals already submitted will be accepted by letter, fax or telegram if received by the Owner prior to the date and hour set for opening of proposals.
- C. Each Bid shall be addressed to the Owner, and shall be delivered to the Office of the Director of Purchasing at the address given in the Notice to Bidders on or before the day and hour set for opening of Bids. Each Bid shall be enclosed in a sealed envelope bearing the title of the Project, the name of the Bidder, and the date and hour of the Bid opening. It is the sole responsibility of the bidder to see that their bid is received on time.

3.08 ADDENDA

- A. Indicate receipt of Addenda on the Bid Form in the spaces provided for acknowledgement.
- B. Failure to indicate receipt may be cause to disqualify a Bid.

3.09 BID FORM - BASE BID(S)

- A. Base Bid(s) shall be based only on the material, construction, equipment and methods named or described in the Specifications, on the Drawings, and any Addenda issued prior to Bidding. See item 1.08 of this Section for substitution request requirements.
- B. On Bids with multiple Base Bid Packages the Owner reserves the right to selectively Award individual Base Bid Packages to multiple Prime Bidders submitting the lowest and best Bids for the individual Bid Packages.

3.10 BID FORM - ALTERNATE BID(S)

- A. Each Bidder, in addition to submission of the Base Bid, shall submit a Bid for any Alternate(s) as called for (if any). Failure to submit said Alternate Bid(s) shall be sufficient cause for the Owner to reject any proposal in its entirety. Also the Owner may consider the Alternate Bid in awarding of a Contract, but is under no obligation to accept any Alternate Bid.

INSTRUCTIONS TO BIDDERS

- B. Proposals shall be based only on the material, construction, equipment and methods named or described in the Specifications, on the Drawings, and any Addenda issued prior to Bidding. See item 1.08 of this Section for substitution request requirements.

## 3.11 BID FORM – ALLOWANCES

- A. Allowances (if any) shall be included in the applicable Bid (Base Bid(s) or Alternate Bid(s)) as called for in the Allowance Section of the Bid Form and/or Section 01 23 60 Allowances.
- B. It is solely at the discretion of the Architect/Engineer/Owner what costs may be applied to an Allowance.
- C. Any unused portion of an Allowance shall be returned to the Owner at Contract Closeout.

## 3.12 COMPLIANCE WITH LAWS

- A. The Bidder shall comply with all applicable federal, state, and local laws, rules, regulations, and ordinances including but not limited to Indiana Code 5-16 and all provisions required thereby to be included herein are hereby incorporated by reference. Bidder warrants Contractor and any subcontractors shall obtain and maintain all required permissions, permits, licenses, registrations, accreditations, certifications, and approvals, and shall comply with all employment, labor, EEOC, E-verify, health, safety, and environmental statutes, rules, or regulations related to the products and services offered under this agreement. Bidder and any principals of the Contractor certify compliance with the requirements of Indiana Code § 5-16-1-9 Application of Indiana Code 5-22-16.5 (e.g. Company has not and will not participate in any investments or activities in Iran and refrains from engaging in any new investments or activities in Iran).
- B. Submission of the signed Bid Form indicates compliance.

## 3.13 NON-COLLUSION AFFIDAVIT

- A. The Bidder, by its officers and agents or representatives present at the time of filing their bid, being duly sworn, say on their oaths that neither they nor any of them have in any way, directly or indirectly, entered into any arrangement or agreement with any other bidder, or with any public office of the State of Indiana, of any county or municipality or other public offices whereby such affiance or either of them, has paid or is to pay to such other bidder or public officer any sum of money, or has given or is to give to such other bidders or public officer anything of value whatever, or such affiance of affiance or either of them has not, directly or indirectly entered into any arrangement or agreement with any other bidder or bidders, which tends to or does lessen or destroy free competition in letting of the contract sought for by the attached bids; that no inducement of any form or character other than which appears upon the face of the bid will be suggested, offered, paid, or delivered to any person whomsoever to influence the acceptance of the said bid or awarding of the contract, nor has this bidder any agreement or understanding of any kind whatsoever, with any person whomsoever to pay, deliver to, or share with any other person in any way or manner, any of the proceeds of the contract sought by this bid.
- B. Submission of the signed Bid Form indicates compliance.

## 3.14 NON-DISCRIMINATION

- A. The Bidder and its Subcontractors, if any, shall not discriminate against any employee or applicant for employment, to be employed in the performance of this Contract, with respect to their hire, tenure, terms, conditions or privileges of employment or any matter directly or indirectly related to employment because of their sex, race, natural origin, ancestry or religion or disability as prohibited under the Americans with Disabilities Act. Breach of this covenant may be regarded as a material breach of the Contract.
- B. Submission of the signed Bid Form indicates compliance.

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INSTRUCTIONS TO BIDDERS

3.15 CERTIFICATION OF UNITED STATES STEEL PRODUCTS

- A. The Bidder certifies that the Bidder and all Subcontractors will comply with the statutory obligations to use steel products made in the United States.
- B. Submission of the signed Bid Form indicates compliance.

3.16 BID FORM - APPENDIX A SUBCONTRACTOR AND SUPPLIER/MANUFACTURERS LISTS

- A. The Prime Contractor (Bidder) shall list all Subcontractors and Suppliers/Manufacturers called for in Appendix A of the Bid Form at the time of Bid Submission. Failure to provide this information may be sufficient cause to disallow a Bid.
- B. **The Prime Contractor (Bidder) shall use the Subcontractors, Suppliers, Materials and Equipment as listed in the Bid Form Appendix "A" submitted at the time of Bid. It is the Prime Contractor's (Bidder's) responsibility to assure they have listed the correct Subcontractors, Suppliers, Materials and Equipment on their Bid Form. THERE SHALL BE NO CHANGES PERMITTED TO THESE LISTS.**

- 1. Exception: If the Owner determines the Subcontractors, Suppliers, Materials or Equipment are not acceptable, the Owner shall notify the Prime Contractor (Bidder) in writing within two (2) working days after receipt of Bids of the unacceptable Subcontractor(s), Supplier(s), Material(s) and/or Equipment(s).

3.17 BID FORM - APPENDIX B UNIT PRICES

- A. Each Bidder shall submit pricing for Unit Prices as called for (if any) in Appendix B. Failure to submit said pricing may be sufficient cause for the Owner to reject any proposal in its entirety. Also the Owner may consider the Unit Pricing in awarding of a Contract.
- B. Unit Prices shall be based only on the material, construction, equipment and methods named or described in the Specifications, on the Drawings, and any Addenda issued prior to Bidding.
- C. Unit prices include all necessary material, plus cost for delivery, installation, insurance, applicable taxes, overhead, and profit.

3.18 BID FORM - APPENDIX C

- A. By 2:00pm on the next business day after receipt of Bids the Bidder shall submit, a wage rate schedule for the workers of the Prime Bidder and all major Subcontractors involved in the Work. The wage rate shall include the worker's hourly rate plus all fringe benefits to be paid to the worker.
- B. A major Subcontractor is defined as any Subcontractor whose portion of the Bid is in excess of \$250,000 or 20% of the total Bid whichever is less.
- C. Failure to submit this wage rate schedule within the allotted time may be sufficient cause to disallow a Bid. The wage rates provided may be used as a basis for Award of the Bid.
- D. The Owner reserves the right to require certified payroll records to be provided to verify the wage rates listed on the wage rate schedule are accurate.

END OF SECTION 00 10 10

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INSTRUCTIONS TO BIDDERS

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CERTIFICATION REGARDING SUSPENSION, DEBARMENT, INELIGIBILITY AND  
VOLUNTARY EXCLUSION

This certificate is required by the regulations implementing Executive Orders 12549 and 12689, Uniform Guidance 2 CFR 200.213 and 2 CFR 180 sections regarding Suspension and Debarment

Is your organization, or its principals, suspended, debarred, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction, by any Federal department or agency?       Yes       No

Are any of your subcontractors, or its principals, suspended, debarred, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction, by any Federal department or agency?       Yes       No

\_\_\_\_\_  
Your Company's Name

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Print Your Name

\_\_\_\_\_  
Date

END OF SECTION 00 10 20

00 10 20  
CERTIFICATION REGARDING SUSPENSION, DEBARMENT, INELIGIBILITY AND  
VOLUNTARY EXCLUSION

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00 10 30  
MBE/WBE/VBE COMPLIANCE INSTRUCTIONS

PART 1 – CONSTRUCTION SERVICES – INSTRUCTION TO BIDDERS

1.01 MBE/WBE/VBE Participation Plan

- A. Indiana State University is committed to diversity and non-discrimination in all aspects of its operations. This initiative is to ensure that certified MBEs, WBEs, and VBEs are included in all invitations for quotes and bids, and that all prospective bidders are notified of Indiana State University's expectation for diversity, including but not limited to MBE/WBE/VBE participation in procurement contracts for professional services, materials, supplies and equipment, and in contracts for the construction, architectural services, renovation or repair of university facilities and equipment. This expectation extends to all tiers of contractor utilization. Each Prime contractor should actively solicit and include certified minority, women and veteran owned subcontractors in bid submissions if economically feasible.
- B. The Minority, Women's and Veteran's Business Enterprise Participation Plan (form included in specifications) shall be submitted with the bid. This Participation Plan will be considered during the proposal evaluation process.
- C. Indiana State University's annual MBE, WBE, and VBE participation goals parallel those set by the Indiana Department of Administration for its own business diversity efforts. The State MBE/WBE participation goals may be found at [www.in.gov/idoa/mwbe/2743.htm](http://www.in.gov/idoa/mwbe/2743.htm) and VBE participation goals may be found at [www.in.gov/idoa/2862.htm](http://www.in.gov/idoa/2862.htm)

1.02 Definitions

- A. "Minority-owned Business Enterprise" (MBE) means an individual, partnership, corporation, limited liability company, or joint venture of any kind that is 51% owned and controlled by (1) or more persons who are (a) United States citizens; and (b) members of a racial minority group: African American, American Indians, Hispanics, Asian Americans, or other similar minority group as defined by 13 CFR 124.103 and have been certified by the State of Indiana.
- B. "Women-owned Business Enterprise" (WBE) means an individual, partnership, corporation, limited liability company, or joint venture of any kind that is 51% owned and controlled by (1) or more persons who are (a) United States citizens; and (b) whose gender is female and have been certified by the State of Indiana.
- C. "Veteran-owned Business Enterprise" (VBE) means an Indiana firm with its principal place of business location in Indiana and is currently certified by the Department of Veterans Affairs as a veteran-owned business and have been certified by the State of Indiana or who have been Federally certified.

1.03 Qualifications for Participation

- A. In order to count toward participation goals, the MBEs and WBEs must be certified by the State of Indiana.
- B. VBEs must be certified by the State of Indiana or have been Federally certified.

1.04 Failure to Participate

- A. Failure to submit the Minority, Women's and Veteran's Business Enterprise Participation Plan with the Bid may be cause to reject a Bid.
- B. The Owner retains the right to hold payment, and/or to reject future bids submitted by the successful Contractor in the event that Contractor misrepresents either MBE/WBE/VBE participation in this Project, or its efforts to obtain MBE/WBE/VBE participation in this project, or fails to report MBE/WBE/VBE spend on this project.
- C. The Owner, at its discretion, may waive in part or in whole the minority-owned business enterprise, women-owned business enterprise and/or veteran-owned business enterprise requirement if in the opinion of the Owner it would be impractical, or not in the best interest of the Owner.

00 10 30  
MBE/WBE/VBE COMPLIANCE INSTRUCTIONS

- 1.05 Mandatory Tier II Reporting Requirement for Projects equal to or greater than \$150,000.00
- A. The successful Contractor shall take all necessary and reasonable steps to ensure that MBE/WBE/VBEs have the maximum opportunity to compete for and perform work on this Contract.
  - B. MBE/WBE/VBE utilization in the performance of this Contract must be reported with each Application for Payment using the ISU Business Diversity Spend Reporting Form for Construction/Renovation/Facilities Repair Projects (see included: Tier II Spend Report Form.xlsx.)
  - C. Compliance with Owner's Mandatory Tier II Reporting Requirement is a condition for the approval of an Applications for Payment.

PART 2 – NOT USED

PART 3 – NOT USED

END OF SECTION 00 10 30

00 10 40  
MBE/WBE/VBE PARTICIPATION PLAN

Project Name \_\_\_\_\_

Bid Number \_\_\_\_\_ Bid Date \_\_\_\_\_

This Form must be completed by all Bidders and submitted with the Bid. **Failure to submit may be cause to reject the Bid.**

Check if Bidder is an MBE, WBE or VBE

Bidders Firm \_\_\_\_\_ MBE      WBE      VBE

Address \_\_\_\_\_

City/State/Zip \_\_\_\_\_

Phone \_\_\_\_\_

E-mail \_\_\_\_\_

The following certified minority, women and/or veteran -owned firms will be participating in the project according to the following schedule. Indicate whether each firm is an MBE, WBE or VBE by selecting the MBE, WBE or VBE box below.

1. \_\_\_\_\_  
FIRM    MBE    WBE    VBE                      TRADE                      AMOUNT                      % OF TOTAL BID

\_\_\_\_\_  
CONTACT NAME    PHONE    E-MAIL

2. \_\_\_\_\_  
FIRM    MBE    WBE    VBE                      TRADE                      AMOUNT                      % OF TOTAL BID

\_\_\_\_\_  
CONTACT NAME    PHONE    E-MAIL

3. \_\_\_\_\_  
FIRM    MBE    WBE    VBE                      TRADE                      AMOUNT                      % OF TOTAL BID

\_\_\_\_\_  
CONTACT NAME    PHONE    E-MAIL

4. \_\_\_\_\_  
FIRM    MBE    WBE    VBE                      TRADE                      AMOUNT                      % OF TOTAL BID

\_\_\_\_\_  
CONTACT NAME    PHONE    E-MAIL

If more space is need attach additional sheet

If no MBE, WBE or VBE contractors are listed above please indicate reason(s) why:

    Unable to locate any MBEs, WBEs or VBEs.

    Unable to secure competitive pricing from any MBEs, WBEs or VBEs.

    Other reasons, please describe: \_\_\_\_\_

00 10 40  
MBE/WBE/VBE PARTICIPATION PLAN

Describe below your efforts to obtain minority, women and veteran's business enterprise participation for this project.

Be sure to attach a copy of all solicitation efforts, e.g., ads that were published or networking events, etc.

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List below the MBE/WBE/VBE contractors you individually contacted to request a quote for this project. If all work is to be self-performed and your Firm is not MBE, WBE or VBE list N/A in top left line below.

MBE, WBE, VBE Firms Contacted

Check all that apply:

1.	FIRM CONTACTED	TRADE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	CONTACT NAME	PHONE	E-MAIL				
2.	FIRM CONTACTED	TRADE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	CONTACT NAME	PHONE	E-MAIL				
3.	FIRM CONTACTED	TRADE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	CONTACT NAME	PHONE	E-MAIL				
4.	FIRM CONTACTED	TRADE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	CONTACT NAME	PHONE	E-MAIL				

If more space is need attach additional sheet

By my signature, I certify that the above statements are true and accurate, all as of the date below. I also understand that any changes to this plan must be approved by Indiana State University and documented by Construction Change Directive.

Agent of Bidder \_\_\_\_\_

Date \_\_\_\_\_

END OF SECTION 00 10 40

**Business Diversity Spend Reporting Form for Construction/Renovation/Facilities Repair Projects**

<b>Date Submitted</b>		<b>IMPORTANT NOTICE</b>
<b>Submitter's Name</b>		
<b>Submitter's Phone #</b>		
<b>Submitter's Email</b>		
<b>Vendor Name</b>		
<b>Project Name</b>		
<b>Project Street Address</b>		
<b>Project city/state</b>		
<b>ISU Bid/Project Number</b>		
<b>ISU Purchase Order No.</b>		

Actual Spend Dates (MM/DD/YYYY) for the month you are reporting.

<b>Month Beginning</b>	
<b>Month Ending</b>	

**Tier II**

Subcontractor Name	Total Contract Committed Amount	For This Month Only Spend Against Committed	Total Spend-to-Date Against Committed	Diversity Class (MBE, MWBE, WBE, VBE)
<b>Total Amount</b>	\$ -	\$ -	\$ -	-

**Tier III**

Subcontractor Name	Total Contract Committed Amount	For This Month Only Spend Against Committed	Total Spend-to-Date Against Committed	Diversity Class (MBE, MWBE, WBE, VBE)
<b>Total Amount</b>	\$ -	\$ -	\$ -	-

**Spend Outside Committed**

Subcontractor Name	Invoiced Amount	Diversity Class (MBE, MWBE, WBE, VBE)
<b>Total Amount</b>	\$ -	-

<b>Summary of all spend to date compared to commitment</b>	
<b>Total Contract Award</b>	
<b>Total Contract Diversity Spend Committed in \$</b>	
<b>Total Contract Percentage of Committed Diversity Spend as %</b>	
<b>Total Contract Spend-to Date</b>	
<b>Total Diversity Spend-to Date in \$</b>	
<b>Total Diversity Spend-to Date as %</b>	

Definitions:  
**Tier II** is defined as Minority, Minority Women, Women and Veteran Owned business who are supplying you with goods, or services, as a Subcontractor, or Supplier on this project.  
**Tier III** is defined as Minority, Minority Women, Women and Veteran Owned business who supply materials, goods, or services to your Subcontractors, or your Suppliers on this project.  
**MBE** is defined as a Minority Owned Business, owns 51% or higher.  
**MWBE** is defined as a Minority/Women Owned Business, owns 51% or higher.  
**WBE** is defined as a Women Owned Business, owns 51% or higher.  
**VBE** is defined as a Veteran Owned Business, owns 51% or higher.

BIDDER'S CERTIFICATION OF AUTHORIZED EMPLOYMENT

In accordance with Indiana Code 22-5-1. 7 as amended, each Contractor in any tier of a public works project shall not knowingly employ unauthorized aliens. Every contractor shall enroll in and verify the work eligibility status of all employees hired after June 30, 2015 using the U.S. Citizenship and Immigration Services (USCIS) E-Verify program as defined in IC §22-5-1.7-3, unless the E-Verify program no longer exists.

The Prime Contractor shall require their subcontractors who perform work under this Contract to certify to the Prime Contractor that the subcontractor does not knowingly employ or contract with an unauthorized alien and that the subcontractor has enrolled and is participating in the E-Verify program. The Prime Contractor agrees to maintain this certification throughout the duration of the term of a contract with a subcontractor. The successful Prime Contractor and its sub-contractors at all levels shall comply with all provisions of the statute or the Contract is subject to cancellation.

I hereby certify that I have read and understand the "Contractor's Certification of Authorized Employment" provision of the Contract Documents In Section 00 20 11 Amendments to General Conditions Article 13, subparagraph 13.1.7.3 and its subparagraphs and that the undersigned and proposed and actual sub-contractors at all tiers shall comply with the provisions of the Statute

On behalf of and as authorized by the Bidder, I affirm and depose that the Bidder and our Subcontractors shall not knowingly employ unauthorized aliens.

\_\_\_\_\_  
(Bidder - Please print full name of your proprietorship, partnership, or corporation)

\_\_\_\_\_  
(Name - Authorized Signing Officer)

\_\_\_\_\_  
(Title)

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

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

END OF SECTION 00 10 45

00 10 45  
BIDDER'S CERTIFICATION OF AUTHORIZED EMPLOYMENT

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Office of the Senior Vice President for  
Finance and Administration and University Treasurer  
Rankin Hall Suite 200  
210 North 7<sup>th</sup> Street  
Terre Haute, Indiana 47809

# Contract for Construction Between Indiana State University and Contractor

ISU Form CfC101-19  
Based on AIA Form A101

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## AGREEMENT

Agreement for the Contract of Construction made as of the \_\_\_\_\_ day of \_\_\_\_\_ in the year  
of Two Thousand and \_\_\_\_\_

**BETWEEN** the Owner  
Indiana State University  
210 North Seventh Street  
Terre Haute, Indiana 47809-0001

and the Contractor:  
(Name and address)

Project is:  
(Name and location)

The Architect/Engineer is:  
(Name and address)

Indiana State University and the Contractor agree as set forth below:



**Part 1 – Contract Documents:**

The Contract Documents include this Contract for Construction, Conditions of the Contract (General and Special Conditions), Drawings, Specifications, Addenda issued prior to execution of this Contract, other documents listed in this Contract, and Modifications issued after execution of this Contract; these form the Contract, and are as fully a part of the Contract as if attached to this Contract or repeated herein. This Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representation or agreements, either written or oral. An enumeration of the Contract Documents and other Modifications appears in Part 9 of this document.

**Part 2 – Work of This Contract:**

The Contractor shall execute the entire work as described in the Contract Documents, except to the extent specifically indicated in the Contract Documents to be the responsibility of others, or as follows:

**Part 3 – Start Date and Substantial Completion Date:**

- 3.01 The Start Date shall be as indicated in Section 00 10 10 of the Project Specifications, as listed in any subsequent Addenda, the Notice to Proceed Letter or as listed below:
  
- 3.02 The Contractor shall achieve Substantial Completion as indicated in Section 00 10 10 of the Project Specifications, as listed in any subsequent Addenda, the Notice to Proceed Letter or as listed below:
  
- 3.03 Substantial Completion maybe adjusted as allowed under Contract Documents or as mutually agreed upon in writing by the Owner and the Contractor.

**Part 4 – Contract Sum:**

- 4.01 Indiana State University shall pay the Contractor in current funds for the Contractor's performance of the Contract the Contract Sum of \_\_\_\_\_dollars (\$\_\_\_\_\_) subject to additions or deductions as provided in the Contract Documents
- 4.02 The Contract Sum is based upon the following Alternates, if any, which are described in the Contract Documents and are hereby accepted by Indiana State University:
- 4.03 Unit Prices, if any, are as follows:
- 4.04 Allowances

**Part 5 – Progress Payments**

- 5.01 Based on an Application for Payment Issued to the Architect/Engineer by the Contractor, Indiana State University shall make progress payments on the account of the Contract Sum to the Contractor as provided below and elsewhere in the Contract Documents.
- 5.02 The period covered by each Application for Payment shall be on a regular monthly basis of not less than Twenty Eight (28) calendar days.
- 5.03 When the Application for Payment is received by the Architect/Engineer, Indiana State University shall make payment within fifteen (15) days after the approval of the Application for Payment by the Architect/Engineer and receipt by Indiana State University Office of Finance and Administration.
- 5.04 Each Application for Payment shall be based on the schedule of values submitted by the Contractor in accordance with the Contract Documents. The schedule of values shall allocate the entire Contract Sum among the various portions of Work and shall be prepared in a form and supported by such data as required by the Architect/Engineer and Indiana State University to evaluate and substantiate the accuracy of the Application for Payment. Unless objected to by the Architect/Engineer or Indiana State University this schedule of values shall be the basis for all Contractor Applications for Payment.
- 5.05 Applications for Payment shall indicate the percentage of completion of each portion of Work as of the end of the application period.
- 5.06 A Partial Waiver of Lien shall be included with each progress Application for Payment.
- 5.07 Subject to provisions of the Contract Documents, the amount of the Application for Payment shall be computed as follows:
  - A. Total of all portions of Work indicated on the schedule of values completed during the application period.
  - B. Total of verified stored materials indicated on the schedule of values acquired during the application period, provided proof of insurance on the storage facility is submitted.
  - C. Total of all Change Orders approved or Change Directives issued during the application period.
  - D. Less a Retainage of ten percent (10%)
  - E. Subtract the aggregate of previous Applications of Payments made to Indiana State University and subtract amounts, if any, withheld or nullified by the Architect/Engineer.
- 5.08 The progress payment amount determined by Section 5.06 shall be further modified under the following circumstances
  - A. Add, upon Substantial Completion of the Work, a sum sufficient to increase the total payments to ninety five percent (95%) of the Contract Sum; less any amounts the Architect/Engineer or Indiana State University shall determine for incomplete work and unsettled claims.
  - B. Add, if final completion of the work is thereafter materially delayed through no fault of the Contractor, any additional amounts payable in accordance with Subparagraph 9.10.3 of the General Conditions.
- 5.09 Reduction or Limitation of Retainage:
  - A. At the sole written discretion of Indiana State University, if acceptable progress is made, at fifty percent (50%) completion of the Contract Sum the remaining Retainage may be reduced to 0%.

**Part 6 – Final Payment**

- 6.01 Final payment, constituting the remaining unpaid balance of the Contract Sum, shall be made to the Contractor by Indiana State University when:
  - A. The Contract has been fully performed by the Contractor as detailed in the Contract Documents.
  - B. Approval of the Final Application for Payment is received from the Architect/Engineer.
- 6.02 No Contractor claims for additional compensation shall be permitted or accepted more than sixty (60) days following the Contractor's submission of their Final Application for Payment.
- 6.03 Payment shall be made by Indiana State University 61 days after issuance of the of the Contractor's Final Application for Payment and Final Waiver of Lien and final approval from the Architect/Engineer of the Final Application for Payment.

**Part 7 – Miscellaneous Provisions**

7.01 Where reference is made in this document to a provision of the General Conditions or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

**Part 8 – Termination or Suspension**

- 8.01 The Contract may be terminated by Indiana State University or the Contractor as provided in Article 14 of the General Conditions.
- 8.02 The Work may be suspended by Indiana State University as provided in Article 14 of the General Conditions.

**Part 9 – Enumeration of Contract Documents**

9.01 The Contract Documents, except for Modifications issued after execution of this Contract, are enumerated as follows:

- A. The agreement is this executed **Contract for Construction Between Indiana State University and Contractor, ISU Form Cfc101-20.**
- B. The General Conditions are the General Conditions of the Contract for Construction, AIA Document A201.
- C. The Supplementary and Other Conditions are those contained in the Project Specifications and are as follows:  
See attached Exhibit A Sections 00 and 01
- D. The Specifications:  
See attached Exhibit A Sections 02-33 as applicable
- E. The Drawings:  
See attached Exhibit B
- F. The Addenda:  

Number	Date	Pages
--------	------	-------
- G. Other Documents, if any, forming the Contract Documents are as follows:

Certification Regarding Suspension, Debarment, Ineligibility and Voluntary Exclusion Form, MBE/WBE/VBE Participation Plan, Contractor's Certification of Authorized Employment Form, Award Letter, Purchase Order

This agreement is entered into as of the day and year first written above and is executed by electronic copy in PDF format of which one is delivered to the Contractor, one is delivered to the Architect/Engineer, and the remainder to Indiana State University for distribution to the ISU Purchasing Department, the Office of the Senior Vice President for Finance and Administration and the ISU Department of Facilities Management.

Indiana State University

Contractor

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

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

\_\_\_\_\_  
**Diann E. McKee**  
(Printed or Typed Name)

\_\_\_\_\_  
(Printed or Typed Name)

**Exhibit A – Refer to Addenda for any additions, deletions or revisions to these Specification Sections**

00 10 50

SAMPLE ISU/CONTRACTOR CONTRACT FOR CONSTRUCTION

**Exhibit B – Refer to Addenda for any additions, deletions or revisions to these Drawings**

BASED ON BID FORM  
FORM NO. 96  
REVISED FORMAT 1/14/2013

GENERAL BID FOR PUBLIC BUILDING

PROJECT: **Dressing Room/Restroom Renovation New Theater Building Bid Number B0028532**

TO: INDIANA STATE UNIVERSITY  
BOARD OF TRUSTEES  
TERRE HAUTE, INDIANA

FROM:

\_\_\_\_\_  
(Name of Bidder) (Company Name)

\_\_\_\_\_  
(Address)

\_\_\_\_\_  
(City, State, Zip)

PHONE NUMBER \_\_\_\_\_

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

SUBMITTED BY: \_\_\_\_\_  
(Signature) (Title)

The Bidder's signature certifies the Bidder is in compliance with all aspects of the Bid Documents

**ADDENDA**

The following Addenda have been received. The modifications to the bidding documents noted therein have been considered and all costs thereto are included in the Bid Sum(s).

Addendum # _____	Dated _____
Addendum # _____	Dated _____
Addendum # _____	Dated _____
Addendum # _____	Dated _____

**OWNER'S RIGHTS REGARDING ACCEPTANCE OF BIDS**

**It is understood that the Owner reserves the right to accept or reject any Bid and to waive any irregularities in Bidding. It is further understood on Bids with multiple Base Bid Packages the Owner reserves the right to selectively Award individual Base Bid Packages to multiple Prime Bidders submitting the lowest and best Bids for the individual Base Bid Packages.**

00 20 00  
BID FORM

TAX EXEMPT

Indiana State University is a Tax Exempt Institution and Indiana Sales Tax for products permanently incorporated in work shall not be included as part of the Bid. All other applicable Federal, State and Local taxes shall be included in the Bid sum. Tax exempt certificate available upon request.

OFFER:

Pursuant to and in compliance with 'Instructions to Bidders', and other Bidding Documents prepared by the Indiana State University Facilities Management Department for the above mentioned project, the signer, having become thoroughly familiar with the terms and conditions of the proposed Contract Documents and with local conditions affecting the performance and costs of the Work at the place where the Work is to be completed, and having fully inspected the site in all particulars, hereby proposes and agrees to fully perform the Work within the time stated and in strict accordance with the intent of the proposed Contract Documents, including furnishing bonds, insurance, labor, materials, and to do all the Work required to construct and complete in accordance with the proposed Contract Documents as follows:

BASE BID

Renovation of Dressing Room/Restroom per Specifications and Drawings

\_\_\_\_\_ Dollars (\$ \_\_\_\_\_ )  
(State Amount in Words)

ALTERNATE BIDS

1. Alternate No. 1: Purchase and install new lockers. See Sheet A101 Plan Note 14 for specifics.

\_\_\_\_\_ Dollars (\$ \_\_\_\_\_ )  
(State Amount in Words) Add  Deduct

ALLOWANCES

1. A \$10,000.00 Allowance shall be included in the Base Bid for Unforeseen Conditions and General Construction Contingency. It is solely at the discretion of the Architect/Engineer/Owner what costs may be applied to this Allowance.

ACCEPTANCE

This offer shall be opened to acceptance and is irrevocable for the period as follows:

- Base Bid and All Alternates - One Hundred Twenty (120) calendar days from the Bid opening date.

If the Owner accepts the Bid within the time period stated above, Bidder will:

- Furnish the required bonds and insurance certificates within ten (10) calendar days of receipt of the Award Letter
- Commence work within seven (7) calendar days of receipt of the Award Letter or as Directed by the Owner.
- Execute the Contract for Construction Between Indiana State University and Contractor within seven (7) calendar days of receipt of the Contract.

The Bidder agrees to coordinate and expedite their work and that if the Award is given within fourteen (14) calendar days from the Bid opening date the work shall be substantially completed as listed in Section 00 10 10 Instructions to Bidders 1.01 C. If the Award is not made within the stated fourteen (14) calendar days then the substantial completion date may be adjusted as allowed by the Contract Documents or as mutually agreed upon in writing by the Owner and Contractor.

00 20 00  
BID FORM

COMPLIANCE WITH LAWS

The Bidder shall comply with all applicable federal, state, and local laws, rules, regulations, and ordinances including but not limited to Indiana Code 5-16 and all provisions required thereby to be included herein are hereby incorporated by reference. Bidder warrants Contractor and any subcontractors shall obtain and maintain all required permissions, permits, licenses, registrations, accreditations, certifications, and approvals, and shall comply with all employment, labor, EEOC, E-verify, health, safety, and environmental statutes, rules, or regulations related to the products and services offered under this agreement. Bidder and any principals of the Contractor certify compliance with the requirements of Indiana Code § 5-16-1-9 Application of Indiana Code 5-22-16.5 (e.g. Company has not and will not participate in any investments or activities in Iran and refrains from engaging in any new investments or activities in Iran).

NON-COLLUSION AFFIDAVIT

The Bidder, by its officers and agents or representatives present at the time of filing their bid, being duly sworn, say on their oaths that neither they nor any of them have in any way, directly or indirectly, entered into any arrangement or agreement with any other bidder, or with any public office of the State of Indiana, of any county or municipality or other public offices whereby such affiance or either of them, has paid or is to pay to such other bidder or public officer any sum of money, or has given or is to give to such other bidders or public officer anything of value whatever, or such affiance or either of them has not, directly or indirectly entered into any arrangement or agreement with any other bidder or bidders, which tends to or does lessen or destroy free competition in letting of the contract sought for by the attached bids; that no inducement of any form or character other than which appears upon the face of the bid will be suggested, offered, paid, or delivered to any person whomsoever to influence the acceptance of the said bid or awarding of the contract, nor has this bidder any agreement or understanding of any kind whatsoever, with any person whomsoever to pay, deliver to, or share with any other person in any way or manner, any of the proceeds of the contract sought by this bid.

NON-DISCRIMINATION

The Bidder and its Subcontractors, if any, shall not discriminate against any employee or applicant for employment, to be employed in the performance of this Contract, with respect to their hire, tenure, terms, conditions or privileges of employment or any matter directly or indirectly related to employment because of their sex, race, natural origin, ancestry or religion or disability as prohibited under the Americans with Disabilities Act. Breach of this covenant may be regarded as a material breach of the Contract.

CERTIFICATION OF UNITED STATES STEEL PRODUCTS

The Bidder certifies that the Bidder and all Subcontractors will comply with the statutory obligations to use steel products made in the United States.

MBE/WBE/VBE BIDDING:

See Section 00 10 30 for requirements for MBE/WBE/VBE Compliance. Section 00 10 40 MBE/WBE/VBE Participation Plan must be completed by **all Bidders** and submitted with the Bid. Failure to submit with the Bid may be sufficient cause to disqualify a Bid.

EXPERIENCE QUESTIONNAIRE

List similar projects completed by your organization:

1. Contract Amount \_\_\_\_\_  
Description \_\_\_\_\_  
Date Completed \_\_\_\_\_  
Owner \_\_\_\_\_  
(Name and phone #)



00 20 00  
BID FORM

2. Contract Amount \_\_\_\_\_  
Description \_\_\_\_\_  
Date Completed \_\_\_\_\_  
Owner \_\_\_\_\_  
(Name and phone #)

List similar projects currently under construction by your organization

1. Contract Amount \_\_\_\_\_  
Description \_\_\_\_\_  
Date Completed \_\_\_\_\_  
Owner \_\_\_\_\_  
(Name and phone #)

2. Contract Amount \_\_\_\_\_  
Description \_\_\_\_\_  
Date Completed \_\_\_\_\_  
Owner \_\_\_\_\_  
(Name and phone #)

Yes  No  Has your organization ever failed to complete any work awarded it?  
If yes, where and why?

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

Yes  No  Does your Organization have any pending litigation or litigation completed within the past five (5) years initiated by your Organization or the Owner as a result of your work on another Project?

If yes, attach a complete listing, with your Bid, of all such litigation(s) and name(s) of Institutions and/or Parties involved with complete contact information. Failure to submit this information may result in disqualification of your Bid.

Yes  No  Has your Organization been cited for violation of State or Federal regulations within the past twelve months?

If yes, what was the violation and resolution?

\_\_\_\_\_

00 20 00  
BID FORM

List references from firms for which your organization has performed work. Provide firm name, contact person name and phone number.

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APPENDICES

The following Appendices are submitted with the Bid:  
Appendix A - Subcontractors and Material/Supplier Lists  
Appendix B - Unit Prices  
Appendix C - Wage Rate Schedule

## OATH AND AFFIRMATION

Attested to this \_\_\_\_ day of \_\_\_\_\_, 202\_\_

By \_\_\_\_\_

## ACKNOWLEDGMENT

State of \_\_\_\_\_  
SS:

County of \_\_\_\_\_

\_\_\_\_\_ being duly sworn, deposes and  
(Name of person)

says that he/she is \_\_\_\_\_ of  
(Title)

\_\_\_\_\_ and that the  
(Name of organization)  
statements contained in the foregoing bid, certification and affidavit are true and correct.

Subscribed and sworn to before me by \_\_\_\_\_

this \_\_\_\_ day of \_\_\_\_\_, 202\_\_

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

My Commission Expires \_\_\_\_\_

County of Residence \_\_\_\_\_

SUPPLEMENTS TO BID FORM

TO: INDIANA STATE UNIVERSITY

PROJECT: **Dressing Room/Restroom Renovation New Theater Building Bid Number B0028532**

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

SUBMITTED BY:  
(full name)

---

(full address)

---

---

In accordance with Instructions to Bidders and Bid Form, we include the Supplements to Bid Form for Appendices listed below. The information provided shall be considered an integral part of the Bid Form.

**Appendix A** - Subcontractor and Manufacturers List (to be submitted at time of Bid)  
Failure to submit may be cause to disqualify bid

\_\_\_\_\_  
(Bidder)

\_\_\_\_\_  
(Project)

The following will be performed (or provided) by the Subcontractors and Manufacturers listed herein and coordinated by us.

The Prime Contractor (Bidder) shall list all Subcontractors and Suppliers/Manufacturers called for in Appendix A of this Bid Form at the time of Bid Submission. Failure to provide this information may be sufficient cause to disallow a Bid.

**The Prime Contractor (Bidder) shall use the Subcontractors, Suppliers, Materials and Equipment as listed in the Bid Form Appendix "A" submitted at the time of Bid. It is the Prime Contractor's (Bidder's) responsibility to assure they have listed the correct Subcontractors, Suppliers, Materials and Equipment on their Bid Form. THERE SHALL BE NO CHANGES PERMITTED TO THESE LISTS.**

Exception: If the Owner determines the Subcontractors, Suppliers, Materials or Equipment are not acceptable, the Owner shall notify the Prime Contractor (Bidder) in writing within two (2) working days after receipt of Bids of the unacceptable Subcontractor(s), Supplier(s), Material(s) and/or Equipment(s).

(Listings begin on next page)

SUBCONTRACTOR LIST

**Bidder shall provide the names of all applicable Subcontractors**

Description	Subcontractor
General Construction	_____
Cabinetry Work	_____
Solid Surface Work	_____
Ceiling Work	_____
Flooring Work	_____
Painting Work	_____
Electrical Work	_____
HVAC	_____
Temperature Control	_____
Plumbing Work	_____
FP Sprinkler Work	_____

SUPPLIER & MANUFACTURERS LIST

**Bidder shall provide the names of all applicable Suppliers and Manufacturers**

Product Description	Supplier	Manufacturer
Ceiling	_____	_____
LVT Flooring	_____	_____
Solid Surface	_____	_____
Plumbing Fixtures	_____	_____
Diffusers	_____	_____
Lighting	_____	_____
	_____	_____
	_____	_____

(Appendix B begins on the next page)

**Appendix B – Unit Prices**

1. No Unit Prices Requested \_\_\_\_\_

**Appendix C – Wage Rate Schedules**

By 2:00pm on the next business day after receipt of Bids the Bidder shall submit, a wage rate schedule for the workers of the Prime Bidder and all major Subcontractors involved in the Work. Failure to supply the wage rate schedule(s) as required by the Bidding Documents may be sufficient cause to disallow a Bid

END OF SECTION 00 20 00

# DRAFT AIA<sup>®</sup> Document A201<sup>™</sup> - 2007

## General Conditions of the Contract for Construction

for the following PROJECT:

(Name and location or address)

<< >>  
<< >>

THE OWNER:

(Name, legal status and address)

<< >>< >>  
<< >>

THE ARCHITECT:

(Name, legal status and address)

<< >>< >>  
<< >>

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- 5 SUBCONTRACTORS
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- 12 UNCOVERING AND CORRECTION OF WORK
- 13 MISCELLANEOUS PROVISIONS
- 14 TERMINATION OR SUSPENSION OF THE CONTRACT
- 15 CLAIMS AND DISPUTES

#### ADDITIONS AND DELETIONS:

The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

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## **ARTICLE 1 GENERAL PROVISIONS**

### **§ 1.1 BASIC DEFINITIONS**

#### **§ 1.1.1 THE CONTRACT DOCUMENTS**

The Contract Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter the Agreement) and consist of the Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive or (4) a written order for a minor change in the Work issued by the Architect. Unless specifically enumerated in the Agreement, the Contract Documents do not include the advertisement or invitation to bid, Instructions to Bidders, sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, the Contractor's bid or proposal, or portions of Addenda relating to bidding requirements.

#### **§ 1.1.2 THE CONTRACT**

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

#### **§ 1.1.3 THE WORK**

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

#### **§ 1.1.4 THE PROJECT**

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

#### **§ 1.1.5 THE DRAWINGS**

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

#### **§ 1.1.6 THE SPECIFICATIONS**

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

#### **§ 1.1.7 INSTRUMENTS OF SERVICE**

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

#### **§ 1.1.8 INITIAL DECISION MAKER**

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

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

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



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

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

### **§ 1.3 CAPITALIZATION**

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

### **§ 1.4 INTERPRETATION**

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

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

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

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

### **§ 1.6 TRANSMISSION OF DATA IN DIGITAL FORM**

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

## **ARTICLE 2 OWNER**

### **§ 2.1 GENERAL**

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

**§ 2.1.2** The Owner shall furnish to the Contractor within fifteen days after receipt of a written request, information necessary and relevant for the Contractor to evaluate, give notice of or enforce mechanic’s lien rights. Such information shall include a correct statement of the record legal title to the property on which the Project is located, usually referred to as the site, and the Owner’s interest therein.

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

**§ 2.2.1** Prior to commencement of the Work, the Contractor may request in writing that the Owner provide reasonable evidence that the Owner has made financial arrangements to fulfill the Owner’s obligations under the Contract. Thereafter, the Contractor may only request such evidence if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) a change in the Work materially changes the Contract Sum; or (3) the Contractor identifies in writing a reasonable concern regarding the Owner’s ability to make payment when due. The Owner shall furnish such evidence as a condition precedent to commencement or continuation of the Work or

the portion of the Work affected by a material change. After the Owner furnishes the evidence, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.

**§ 2.2.2** Except for permits and fees that are the responsibility of the Contractor under the Contract Documents, including those required under Section 3.7.1, the Owner shall secure and pay for necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities.

**§ 2.2.3** The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. The Contractor shall be entitled to rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work.

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

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

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

If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 or repeatedly fails to carry out Work in accordance with the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Section 6.1.3.

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

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

## **ARTICLE 3 CONTRACTOR**

### **§ 3.1 GENERAL**

**§ 3.1.1** The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Contractor shall be lawfully licensed, if required in the jurisdiction where the Project is located. The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under this Contract. The term "Contractor" means the Contractor or the Contractor's authorized representative.

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

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

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

**§ 3.2.1** Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed and correlated personal observations with requirements of the Contract Documents.

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

**§ 3.2.3** The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, but the Contractor shall promptly report to the Architect any nonconformity discovered by or made known to the Contractor as a request for information in such form as the Architect may require.

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

### **§ 3.3 SUPERVISION AND CONSTRUCTION PROCEDURES**

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

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

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

### **§ 3.4 LABOR AND MATERIALS**

**§ 3.4.1** Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other

facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

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

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

### **§ 3.5 WARRANTY**

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

### **§ 3.6 TAXES**

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

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

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

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

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

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

**§ 3.7.5** If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, archaeological sites or wetlands not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner and Architect. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume

the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 15.

### § 3.8 ALLOWANCES

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

§ 3.8.2 Unless otherwise provided in the Contract Documents,

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

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

### § 3.9 SUPERINTENDENT

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

§ 3.9.2 The Contractor, as soon as practicable after award of the Contract, shall furnish in writing to the Owner through the Architect the name and qualifications of a proposed superintendent. The Architect may reply within 14 days to the Contractor in writing stating (1) whether the Owner or the Architect has reasonable objection to the proposed superintendent or (2) that the Architect requires additional time to review. Failure of the Architect to reply within the 14 day period shall constitute notice of no reasonable objection.

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

### § 3.10 CONTRACTOR'S CONSTRUCTION SCHEDULES

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

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

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

### § 3.11 DOCUMENTS AND SAMPLES AT THE SITE

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

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

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

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

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

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

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

§ 3.12.6 By submitting Shop Drawings, Product Data, Samples and similar submittals, the Contractor represents to the Owner and Architect that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

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

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

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

§ 3.12.10 The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. The Contractor shall not be

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

### § 3.13 USE OF SITE

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

### § 3.14 CUTTING AND PATCHING

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

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

### § 3.15 CLEANING UP

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

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

### § 3.16 ACCESS TO WORK

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

### § 3.17 ROYALTIES, PATENTS AND COPYRIGHTS

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

### **§ 3.18 INDEMNIFICATION**

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

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

### **ARTICLE 4 ARCHITECT**

#### **§ 4.1 GENERAL**

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

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

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

#### **§ 4.2 ADMINISTRATION OF THE CONTRACT**

**§ 4.2.1** The Architect will provide administration of the Contract as described in the Contract Documents and will be an Owner's representative during construction until the date the Architect issues the final Certificate for Payment. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

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

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



#### **§ 4.2.4 COMMUNICATIONS FACILITATING CONTRACT ADMINISTRATION**

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

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

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

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

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

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

**§ 4.2.10** If the Owner and Architect agree, the Architect will provide one or more project representatives to assist in carrying out the Architect's responsibilities at the site. The duties, responsibilities and limitations of authority of such project representatives shall be as set forth in an exhibit to be incorporated in the Contract Documents.

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

**§ 4.2.12** Interpretations and decisions of the Architect will be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of drawings. When making such interpretations and decisions, the Architect will endeavor to secure faithful performance by both Owner and Contractor, will not show partiality to either and will not be liable for results of interpretations or decisions rendered in good faith.

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

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

## **ARTICLE 5 SUBCONTRACTORS**

### **§ 5.1 DEFINITIONS**

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

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

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

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

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

**§ 5.2.3** If the Owner or Architect has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or Architect has no reasonable objection. If the proposed but rejected Subcontractor was reasonably capable of performing the Work, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute Subcontractor's Work. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required.

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

### **§ 5.3 SUBCONTRACTUAL RELATIONS**

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

be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

#### **§ 5.4 CONTINGENT ASSIGNMENT OF SUBCONTRACTS**

**§ 5.4.1** Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner, provided that

- .1 assignment is effective only after termination of the Contract by the Owner for cause pursuant to Section 14.2 and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor in writing; and
- .2 assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

When the Owner accepts the assignment of a subcontract agreement, the Owner assumes the Contractor's rights and obligations under the subcontract.

**§ 5.4.2** Upon such assignment, if the Work has been suspended for more than 30 days, the Subcontractor's compensation shall be equitably adjusted for increases in cost resulting from the suspension.

**§ 5.4.3** Upon such assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor contractor or other entity. If the Owner assigns the subcontract to a successor contractor or other entity, the Owner shall nevertheless remain legally responsible for all of the successor contractor's obligations under the subcontract.

### **ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS**

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

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

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

**§ 6.1.3** The Owner shall provide for coordination of the activities of the Owner's own forces and of each separate contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with other separate contractors and the Owner in reviewing their construction schedules. The Contractor shall make any revisions to the construction schedule deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, separate contractors and the Owner until subsequently revised.

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

#### **§ 6.2 MUTUAL RESPONSIBILITY**

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

**§ 6.2.2** If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner or a separate contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly report to the Architect apparent discrepancies or defects in such other construction that would render it unsuitable for such proper execution and results. Failure of the Contractor so to report shall constitute an acknowledgment that

the Owner's or separate contractor's completed or partially completed construction is fit and proper to receive the Contractor's Work, except as to defects not then reasonably discoverable.

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

**§ 6.2.4** The Contractor shall promptly remedy damage the Contractor wrongfully causes to completed or partially completed construction or to property of the Owner or separate contractors as provided in Section 10.2.5.

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

### **§ 6.3 OWNER'S RIGHT TO CLEAN UP**

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

## **ARTICLE 7 CHANGES IN THE WORK**

### **§ 7.1 GENERAL**

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

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

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

### **§ 7.2 CHANGE ORDERS**

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

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

### **§ 7.3 CONSTRUCTION CHANGE DIRECTIVES**

**§ 7.3.1** A Construction Change Directive is a written order prepared by the Architect and signed by the Owner and Architect, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

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

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

- .1 Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
- .2 Unit prices stated in the Contract Documents or subsequently agreed upon;
- .3 Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or

.4 As provided in Section 7.3.7.

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

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

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

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

- .1 Costs of labor, including social security, old age and unemployment insurance, fringe benefits required by agreement or custom, and workers' compensation insurance;
- .2 Costs of materials, supplies and equipment, including cost of transportation, whether incorporated or consumed;
- .3 Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;
- .4 Costs of premiums for all bonds and insurance, permit fees, and sales, use or similar taxes related to the Work; and
- .5 Additional costs of supervision and field office personnel directly attributable to the change.

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

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

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

#### **§ 7.4 MINOR CHANGES IN THE WORK**

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

## ARTICLE 8 TIME

### § 8.1 DEFINITIONS

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

§ 8.1.2 The date of commencement of the Work is the date established in the Agreement.

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

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

### § 8.2 PROGRESS AND COMPLETION

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

§ 8.2.2 The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, prematurely commence operations on the site or elsewhere prior to the effective date of insurance required by Article 11 to be furnished by the Contractor and Owner. The date of commencement of the Work shall not be changed by the effective date of such insurance.

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

### § 8.3 DELAYS AND EXTENSIONS OF TIME

§ 8.3.1 If the Contractor is delayed at any time in the commencement or progress of the Work by an act or neglect of the Owner or Architect, or of an employee of either, or of a separate contractor employed by the Owner; or by changes ordered in the Work; or by labor disputes, fire, unusual delay in deliveries, unavoidable casualties or other causes beyond the Contractor’s control; or by delay authorized by the Owner pending mediation and arbitration; or by other causes that the Architect determines may justify delay, then the Contract Time shall be extended by Change Order for such reasonable time as the Architect may determine.

§ 8.3.2 Claims relating to time shall be made in accordance with applicable provisions of Article 15.

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

## ARTICLE 9 PAYMENTS AND COMPLETION

### § 9.1 CONTRACT SUM

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

### § 9.2 SCHEDULE OF VALUES

Where the Contract is based on a stipulated sum or Guaranteed Maximum Price, the Contractor shall submit to the Architect, before the first Application for Payment, a schedule of values allocating the entire Contract Sum to the various portions of the Work and prepared in such form and supported by such data to substantiate its accuracy as the Architect may require. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor’s Applications for Payment.

### § 9.3 APPLICATIONS FOR PAYMENT

§ 9.3.1 At least ten days before the date established for each progress payment, the Contractor shall submit to the Architect an itemized Application for Payment prepared in accordance with the schedule of values, if required under Section 9.2, for completed portions of the Work. Such application shall be notarized, if required, and supported by such data substantiating the Contractor’s right to payment as the Owner or Architect may require, such as copies of requisitions from Subcontractors and material suppliers, and shall reflect retainage if provided for in the Contract Documents.

§ 9.3.1.1 As provided in Section 7.3.9, such applications may include requests for payment on account of changes in the Work that have been properly authorized by Construction Change Directives, or by interim determinations of the Architect, but not yet included in Change Orders.

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

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

§ 9.3.3 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor's knowledge, information and belief, be free and clear of liens, claims, security interests or encumbrances in favor of the Contractor, Subcontractors, material suppliers, or other persons or entities making a claim by reason of having provided labor, materials and equipment relating to the Work.

#### § 9.4 CERTIFICATES FOR PAYMENT

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

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

#### § 9.5 DECISIONS TO WITHHOLD CERTIFICATION

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

- .1 defective Work not remedied;
- .2 third party claims filed or reasonable evidence indicating probable filing of such claims unless security acceptable to the Owner is provided by the Contractor;

- .3 failure of the Contractor to make payments properly to Subcontractors or for labor, materials or equipment;
- .4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
- .5 damage to the Owner or a separate contractor;
- .6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; or
- .7 repeated failure to carry out the Work in accordance with the Contract Documents.

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

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

## **§ 9.6 PROGRESS PAYMENTS**

**§ 9.6.1** After the Architect has issued a Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Architect.

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

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

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

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

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

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

## **§ 9.7 FAILURE OF PAYMENT**

If the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within seven days after receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within seven days after the date established in the Contract Documents the amount certified by the Architect or awarded by binding dispute resolution, then the Contractor may, upon seven additional days' written notice to the Owner and Architect,



stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shut-down, delay and start-up, plus interest as provided for in the Contract Documents.

## **§ 9.8 SUBSTANTIAL COMPLETION**

**§ 9.8.1** Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use.

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

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

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

**§ 9.8.5** The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in such Certificate. Upon such acceptance and consent of surety, if any, the Owner shall make payment of retainage applying to such Work or designated portion thereof. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents.

## **§ 9.9 PARTIAL OCCUPANCY OR USE**

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

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

**§ 9.9.3** Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

## **§ 9.10 FINAL COMPLETION AND FINAL PAYMENT**

**§ 9.10.1** Upon receipt of the Contractor's written notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection and, when the

Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment stating that to the best of the Architect's knowledge, information and belief, and on the basis of the Architect's on-site visits and inspections, the Work has been completed in accordance with terms and conditions of the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Architect's final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

**§ 9.10.2** Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect and will not be canceled or allowed to expire until at least 30 days' prior written notice has been given to the Owner, (3) a written statement that the Contractor knows of no substantial reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment and (5), if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts, releases and waivers of liens, claims, security interests or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien. If such lien remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging such lien, including all costs and reasonable attorneys' fees.

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

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

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

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

## **ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY**

### **§ 10.1 SAFETY PRECAUTIONS AND PROGRAMS**

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

### **§ 10.2 SAFETY OF PERSONS AND PROPERTY**

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

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

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

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

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

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

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

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

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

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

#### § 10.3 HAZARDOUS MATERIALS

§ 10.3.1 The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and report the condition to the Owner and Architect in writing.

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

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

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

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

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

#### **§ 10.4 EMERGENCIES**

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

### **ARTICLE 11 INSURANCE AND BONDS**

#### **§ 11.1 CONTRACTOR'S LIABILITY INSURANCE**

**§ 11.1.1** The Contractor shall purchase from and maintain in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located such insurance as will protect the Contractor from claims set forth below which may arise out of or result from the Contractor's operations and completed operations under the Contract and for which the Contractor may be legally liable, whether such operations be by the Contractor or by a Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:

- .1 Claims under workers' compensation, disability benefit and other similar employee benefit acts that are applicable to the Work to be performed;
- .2 Claims for damages because of bodily injury, occupational sickness or disease, or death of the Contractor's employees;
- .3 Claims for damages because of bodily injury, sickness or disease, or death of any person other than the Contractor's employees;
- .4 Claims for damages insured by usual personal injury liability coverage;
- .5 Claims for damages, other than to the Work itself, because of injury to or destruction of tangible property, including loss of use resulting therefrom;
- .6 Claims for damages because of bodily injury, death of a person or property damage arising out of ownership, maintenance or use of a motor vehicle;
- .7 Claims for bodily injury or property damage arising out of completed operations; and
- .8 Claims involving contractual liability insurance applicable to the Contractor's obligations under Section 3.18.

**§ 11.1.2** The insurance required by Section 11.1.1 shall be written for not less than limits of liability specified in the Contract Documents or required by law, whichever coverage is greater. Coverages, whether written on an occurrence or claims-made basis, shall be maintained without interruption from the date of commencement of the Work until the date of final payment and termination of any coverage required to be maintained after final payment, and, with respect to the Contractor's completed operations coverage, until the expiration of the period for correction

of Work or for such other period for maintenance of completed operations coverage as specified in the Contract Documents.

**§ 11.1.3** Certificates of insurance acceptable to the Owner shall be filed with the Owner prior to commencement of the Work and thereafter upon renewal or replacement of each required policy of insurance. These certificates and the insurance policies required by this Section 11.1 shall contain a provision that coverages afforded under the policies will not be canceled or allowed to expire until at least 30 days' prior written notice has been given to the Owner. An additional certificate evidencing continuation of liability coverage, including coverage for completed operations, shall be submitted with the final Application for Payment as required by Section 9.10.2 and thereafter upon renewal or replacement of such coverage until the expiration of the time required by Section 11.1.2. Information concerning reduction of coverage on account of revised limits or claims paid under the General Aggregate, or both, shall be furnished by the Contractor with reasonable promptness.

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

### **§ 11.2 OWNER'S LIABILITY INSURANCE**

The Owner shall be responsible for purchasing and maintaining the Owner's usual liability insurance.

### **§ 11.3 PROPERTY INSURANCE**

**§ 11.3.1** Unless otherwise provided, the Owner shall purchase and maintain, in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located, property insurance written on a builder's risk "all-risk" or equivalent policy form in the amount of the initial Contract Sum, plus value of subsequent Contract Modifications and cost of materials supplied or installed by others, comprising total value for the entire Project at the site on a replacement cost basis without optional deductibles. Such property insurance shall be maintained, unless otherwise provided in the Contract Documents or otherwise agreed in writing by all persons and entities who are beneficiaries of such insurance, until final payment has been made as provided in Section 9.10 or until no person or entity other than the Owner has an insurable interest in the property required by this Section 11.3 to be covered, whichever is later. This insurance shall include interests of the Owner, the Contractor, Subcontractors and Sub-subcontractors in the Project.

**§ 11.3.1.1** Property insurance shall be on an "all-risk" or equivalent policy form and shall include, without limitation, insurance against the perils of fire (with extended coverage) and physical loss or damage including, without duplication of coverage, theft, vandalism, malicious mischief, collapse, earthquake, flood, windstorm, falsework, testing and startup, temporary buildings and debris removal including demolition occasioned by enforcement of any applicable legal requirements, and shall cover reasonable compensation for Architect's and Contractor's services and expenses required as a result of such insured loss.

**§ 11.3.1.2** If the Owner does not intend to purchase such property insurance required by the Contract and with all of the coverages in the amount described above, the Owner shall so inform the Contractor in writing prior to commencement of the Work. The Contractor may then effect insurance that will protect the interests of the Contractor, Subcontractors and Sub-subcontractors in the Work, and by appropriate Change Order the cost thereof shall be charged to the Owner. If the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain insurance as described above, without so notifying the Contractor in writing, then the Owner shall bear all reasonable costs properly attributable thereto.

**§ 11.3.1.3** If the property insurance requires deductibles, the Owner shall pay costs not covered because of such deductibles.

**§ 11.3.1.4** This property insurance shall cover portions of the Work stored off the site, and also portions of the Work in transit.

**§ 11.3.1.5** Partial occupancy or use in accordance with Section 9.9 shall not commence until the insurance company or companies providing property insurance have consented to such partial occupancy or use by endorsement or

otherwise. The Owner and the Contractor shall take reasonable steps to obtain consent of the insurance company or companies and shall, without mutual written consent, take no action with respect to partial occupancy or use that would cause cancellation, lapse or reduction of insurance.

### **§ 11.3.2 BOILER AND MACHINERY INSURANCE**

The Owner shall purchase and maintain boiler and machinery insurance required by the Contract Documents or by law, which shall specifically cover such insured objects during installation and until final acceptance by the Owner; this insurance shall include interests of the Owner, Contractor, Subcontractors and Sub-subcontractors in the Work, and the Owner and Contractor shall be named insureds.

### **§ 11.3.3 LOSS OF USE INSURANCE**

The Owner, at the Owner's option, may purchase and maintain such insurance as will insure the Owner against loss of use of the Owner's property due to fire or other hazards, however caused. The Owner waives all rights of action against the Contractor for loss of use of the Owner's property, including consequential losses due to fire or other hazards however caused.

**§ 11.3.4** If the Contractor requests in writing that insurance for risks other than those described herein or other special causes of loss be included in the property insurance policy, the Owner shall, if possible, include such insurance, and the cost thereof shall be charged to the Contractor by appropriate Change Order.

**§ 11.3.5** If during the Project construction period the Owner insures properties, real or personal or both, at or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, the Owner shall waive all rights in accordance with the terms of Section 11.3.7 for damages caused by fire or other causes of loss covered by this separate property insurance. All separate policies shall provide this waiver of subrogation by endorsement or otherwise.

**§ 11.3.6** Before an exposure to loss may occur, the Owner shall file with the Contractor a copy of each policy that includes insurance coverages required by this Section 11.3. Each policy shall contain all generally applicable conditions, definitions, exclusions and endorsements related to this Project. Each policy shall contain a provision that the policy will not be canceled or allowed to expire, and that its limits will not be reduced, until at least 30 days' prior written notice has been given to the Contractor.

### **§ 11.3.7 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 described in Article 6, 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 property insurance obtained pursuant to this Section 11.3 or other property insurance applicable to the Work, except such rights as they have to proceeds of such insurance held by the Owner as fiduciary. The Owner or Contractor, as appropriate, shall require of the Architect, Architect's consultants, separate contractors described in Article 6, if any, and the subcontractors, sub-subcontractors, 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 a 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.

**§ 11.3.8** A loss insured under the Owner's property insurance shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.3.10. The Contractor shall pay Subcontractors their just shares of insurance proceeds received by the Contractor, and by appropriate agreements, written where legally required for validity, shall require Subcontractors to make payments to their Sub-subcontractors in similar manner.

**§ 11.3.9** If required in writing by a party in interest, the Owner as fiduciary shall, upon occurrence of an insured loss, give bond for proper performance of the Owner's duties. The cost of required bonds shall be charged against proceeds received as fiduciary. The Owner shall deposit in a separate account proceeds so received, which the

Owner shall distribute in accordance with such agreement as the parties in interest may reach, or as determined in accordance with the method of binding dispute resolution selected in the Agreement between the Owner and Contractor. If after such loss no other special agreement is made and unless the Owner terminates the Contract for convenience, replacement of damaged property shall be performed by the Contractor after notification of a Change in the Work in accordance with Article 7.

**§ 11.3.10** The Owner as fiduciary shall have power to adjust and settle a loss with insurers unless one of the parties in interest shall object in writing within five days after occurrence of loss to the Owner's exercise of this power; if such objection is made, the dispute shall be resolved in the manner selected by the Owner and Contractor as the method of binding dispute resolution in the Agreement. If the Owner and Contractor have selected arbitration as the method of binding dispute resolution, the Owner as fiduciary shall make settlement with insurers or, in the case of a dispute over distribution of insurance proceeds, in accordance with the directions of the arbitrators.

#### **§ 11.4 PERFORMANCE BOND AND PAYMENT BOND**

**§ 11.4.1** The Owner shall have the right to require the Contractor to furnish bonds covering faithful performance of the Contract and payment of obligations arising thereunder as stipulated in bidding requirements or specifically required in the Contract Documents on the date of execution of the Contract.

**§ 11.4.2** Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished.

### **ARTICLE 12 UNCOVERING AND CORRECTION OF WORK**

#### **§ 12.1 UNCOVERING OF WORK**

**§ 12.1.1** If a portion of the Work is covered contrary to the Architect's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by the Architect, be uncovered for the Architect's examination and be replaced at the Contractor's expense without change in the Contract Time.

**§ 12.1.2** If a portion of the Work has been covered that the Architect has not specifically requested to examine prior to its being covered, the Architect may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, costs of uncovering and replacement shall, by appropriate Change Order, be at the Owner's expense. If such Work is not in accordance with the Contract Documents, such costs and the cost of correction shall be at the Contractor's expense unless the condition was caused by the Owner or a separate contractor in which event the Owner shall be responsible for payment of such costs.

#### **§ 12.2 CORRECTION OF WORK**

##### **§ 12.2.1 BEFORE OR AFTER SUBSTANTIAL COMPLETION**

The Contractor shall promptly correct Work rejected by the Architect or failing to conform to the requirements of the Contract Documents, whether discovered before or after Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the Architect's services and expenses made necessary thereby, shall be at the Contractor's expense.

##### **§ 12.2.2 AFTER SUBSTANTIAL COMPLETION**

**§ 12.2.2.1** In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9.1, or by terms of an applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of written notice from the Owner to do so unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner or Architect, the Owner may correct it in accordance with Section 2.4.

§ 12.2.2.2 The one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual completion of that portion of the Work.

§ 12.2.2.3 The one-year period for correction of Work shall not be extended by corrective Work performed by the Contractor pursuant to this Section 12.2.

§ 12.2.3 The Contractor shall remove from the site portions of the Work that are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

§ 12.2.4 The Contractor shall bear the cost of correcting destroyed or damaged construction, whether completed or partially completed, of the Owner or separate contractors caused by the Contractor's correction or removal of Work that is not in accordance with the requirements of the Contract Documents.

§ 12.2.5 Nothing contained in this Section 12.2 shall be construed to establish a period of limitation with respect to other obligations the Contractor has under the Contract Documents. Establishment of the one-year period for correction of Work as described in Section 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

### § 12.3 ACCEPTANCE OF NONCONFORMING WORK

If the Owner prefers to accept Work that is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

## ARTICLE 13 MISCELLANEOUS PROVISIONS

### § 13.1 GOVERNING LAW

The Contract shall be governed by the law of the place where the Project is located except that, if the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4.

### § 13.2 SUCCESSORS AND ASSIGNS

§ 13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns and legal representatives to covenants, agreements and obligations contained in the Contract Documents. Except as provided in Section 13.2.2, neither party to the Contract shall assign the Contract as a whole without written consent of the other. If either party attempts to make such an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

§ 13.2.2 The Owner may, without consent of the Contractor, assign the Contract to a lender providing construction financing for the Project, if the lender assumes the Owner's rights and obligations under the Contract Documents. The Contractor shall execute all consents reasonably required to facilitate such assignment.

### § 13.3 WRITTEN NOTICE

Written notice shall be deemed to have been duly served if delivered in person to the individual, to a member of the firm or entity, or to an officer of the corporation for which it was intended; or if delivered at, or sent by registered or certified mail or by courier service providing proof of delivery to, the last business address known to the party giving notice.

### § 13.4 RIGHTS AND REMEDIES

§ 13.4.1 Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights and remedies otherwise imposed or available by law.

§ 13.4.2 No action or failure to act by the Owner, Architect or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach there under, except as may be specifically agreed in writing.



## § 13.5 TESTS AND INSPECTIONS

§ 13.5.1 Tests, inspections and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections and approvals. The Contractor shall give the Architect timely notice of when and where tests and inspections are to be made so that the Architect may be present for such procedures. The Owner shall bear costs of (1) tests, inspections or approvals that do not become requirements until after bids are received or negotiations concluded, and (2) tests, inspections or approvals where building codes or applicable laws or regulations prohibit the Owner from delegating their cost to the Contractor.

§ 13.5.2 If the Architect, Owner or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection or approval not included under Section 13.5.1, the Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection or approval by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Architect of when and where tests and inspections are to be made so that the Architect may be present for such procedures. Such costs, except as provided in Section 13.5.3, shall be at the Owner's expense.

§ 13.5.3 If such procedures for testing, inspection or approval under Sections 13.5.1 and 13.5.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure including those of repeated procedures and compensation for the Architect's services and expenses shall be at the Contractor's expense.

§ 13.5.4 Required certificates of testing, inspection or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Architect.

§ 13.5.5 If the Architect is to observe tests, inspections or approvals required by the Contract Documents, the Architect will do so promptly and, where practicable, at the normal place of testing.

§ 13.5.6 Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

## § 13.6 INTEREST

Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at such rate as the parties may agree upon in writing or, in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.

## § 13.7 TIME LIMITS ON CLAIMS

The Owner and Contractor shall commence all claims and causes of action, whether in contract, tort, breach of warranty or otherwise, against the other arising out of or related to the Contract in accordance with the requirements of the final dispute resolution method selected in the Agreement within the time period specified by applicable law, but in any case not more than 10 years after the date of Substantial Completion of the Work. The Owner and Contractor waive all claims and causes of action not commenced in accordance with this Section 13.7.

## ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

### § 14.1 TERMINATION BY THE CONTRACTOR

§ 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of 30 consecutive days through no act or fault of the Contractor or a Subcontractor, Sub-subcontractor or their agents or employees or any other persons or entities performing portions of the Work under direct or indirect contract with the Contractor, for any of the following reasons:

- .1 Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;
- .2 An act of government, such as a declaration of national emergency that requires all Work to be stopped;

- .3 Because the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents; or
- .4 The Owner has failed to furnish to the Contractor promptly, upon the Contractor's request, reasonable evidence as required by Section 2.2.1.

**§ 14.1.2** The Contractor may terminate the Contract if, through no act or fault of the Contractor or a Subcontractor, Sub-subcontractor or their agents or employees or any other persons or entities performing portions of the Work under direct or indirect contract with the Contractor, repeated suspensions, delays or interruptions of the entire Work by the Owner as described in Section 14.3 constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, or 120 days in any 365-day period, whichever is less.

**§ 14.1.3** If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days' written notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed, including reasonable overhead and profit, costs incurred by reason of such termination, and damages.

**§ 14.1.4** If the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor or a Subcontractor or their agents or employees or any other persons performing portions of the Work under contract with the Contractor because the Owner has repeatedly failed to fulfill the Owner's obligations under the Contract Documents with respect to matters important to the progress of the Work, the Contractor may, upon seven additional days' written notice to the Owner and the Architect, terminate the Contract and recover from the Owner as provided in Section 14.1.3.

#### **§ 14.2 TERMINATION BY THE OWNER FOR CAUSE**

**§ 14.2.1** The Owner may terminate the Contract if the Contractor

- .1 repeatedly refuses or fails to supply enough properly skilled workers or proper materials;
- .2 fails to make payment to Subcontractors for materials or labor in accordance with the respective agreements between the Contractor and the Subcontractors;
- .3 repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or
- .4 otherwise is guilty of substantial breach of a provision of the Contract Documents.

**§ 14.2.2** When any of the above reasons exist, the Owner, upon certification by the Initial Decision Maker that sufficient cause exists to justify such action, may without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven days' written notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

- .1 Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;
- .2 Accept assignment of subcontracts pursuant to Section 5.4; and
- .3 Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

**§ 14.2.3** When the Owner terminates the Contract for one of the reasons stated in Section 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished.

**§ 14.2.4** If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Architect's services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall be certified by the Initial Decision Maker, upon application, and this obligation for payment shall survive termination of the Contract.

#### **§ 14.3 SUSPENSION BY THE OWNER FOR CONVENIENCE**

**§ 14.3.1** The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work in whole or in part for such period of time as the Owner may determine.

**§ 14.3.2** The Contract Sum and Contract Time shall be adjusted for increases in the cost and time caused by suspension, delay or interruption as described in Section 14.3.1. Adjustment of the Contract Sum shall include profit. No adjustment shall be made to the extent

- .1 that performance is, was or would have been so suspended, delayed or interrupted by another cause for which the Contractor is responsible; or
- .2 that an equitable adjustment is made or denied under another provision of the Contract.

#### **§ 14.4 TERMINATION BY THE OWNER FOR CONVENIENCE**

**§ 14.4.1** The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause.

**§ 14.4.2** Upon receipt of written notice from the Owner of such termination for the Owner's convenience, the Contractor shall

- .1 cease operations as directed by the Owner in the notice;
- .2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and
- .3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

**§ 14.4.3** In case of such termination for the Owner's convenience, the Contractor shall be entitled to receive payment for Work executed, and costs incurred by reason of such termination, along with reasonable overhead and profit on the Work not executed.

### **ARTICLE 15 CLAIMS AND DISPUTES**

#### **§ 15.1 CLAIMS**

##### **§ 15.1.1 DEFINITION**

A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim.

##### **§ 15.1.2 NOTICE OF CLAIMS**

Claims by either the Owner or Contractor must be initiated by written notice to the other party and to the Initial Decision Maker with a copy sent to the Architect, if the Architect is not serving as the Initial Decision Maker. Claims by either party must be initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.

##### **§ 15.1.3 CONTINUING CONTRACT PERFORMANCE**

Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents. The Architect will prepare Change Orders and issue Certificates for Payment in accordance with the decisions of the Initial Decision Maker.

##### **§ 15.1.4 CLAIMS FOR ADDITIONAL COST**

If the Contractor wishes to make a Claim for an increase in the Contract Sum, written notice as provided herein shall be given before proceeding to execute the Work. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4.

##### **§ 15.1.5 CLAIMS FOR ADDITIONAL TIME**

**§ 15.1.5.1** If the Contractor wishes to make a Claim for an increase in the Contract Time, written notice as provided herein shall be given. The Contractor's Claim shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay, only one Claim is necessary.

**§ 15.1.5.2** If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated and had an adverse effect on the scheduled construction.

### § 15.1.6 CLAIMS FOR CONSEQUENTIAL DAMAGES

The Contractor and Owner waive Claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes

- .1 damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and
- .2 damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit except anticipated profit arising directly from the Work.

This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with Article 14. Nothing contained in this Section 15.1.6 shall be deemed to preclude an award of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

### § 15.2 INITIAL DECISION

§ 15.2.1 Claims, excluding those arising under Sections 10.3, 10.4, 11.3.9, and 11.3.10, shall be referred to the Initial Decision Maker for initial decision. The Architect will serve as the Initial Decision Maker, unless otherwise indicated in the Agreement. Except for those Claims excluded by this Section 15.2.1, an initial decision shall be required as a condition precedent to mediation of any Claim arising prior to the date final payment is due, unless 30 days have passed after the Claim has been referred to the Initial Decision Maker with no decision having been rendered. Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.

§ 15.2.2 The Initial Decision Maker will review Claims and within ten days of the receipt of a Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) reject the Claim in whole or in part, (3) approve the Claim, (4) suggest a compromise, or (5) advise the parties that the Initial Decision Maker is unable to resolve the Claim if the Initial Decision Maker lacks sufficient information to evaluate the merits of the Claim or if the Initial Decision Maker concludes that, in the Initial Decision Maker's sole discretion, it would be inappropriate for the Initial Decision Maker to resolve the Claim.

§ 15.2.3 In evaluating Claims, the Initial Decision Maker may, but shall not be obligated to, consult with or seek information from either party or from persons with special knowledge or expertise who may assist the Initial Decision Maker in rendering a decision. The Initial Decision Maker may request the Owner to authorize retention of such persons at the Owner's expense.

§ 15.2.4 If the Initial Decision Maker requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond, within ten days after receipt of such request, and shall either (1) provide a response on the requested supporting data, (2) advise the Initial Decision Maker when the response or supporting data will be furnished or (3) advise the Initial Decision Maker that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Initial Decision Maker will either reject or approve the Claim in whole or in part.

§ 15.2.5 The Initial Decision Maker will render an initial decision approving or rejecting the Claim, or indicating that the Initial Decision Maker is unable to resolve the Claim. This initial decision shall (1) be in writing; (2) state the reasons therefor; and (3) notify the parties and the Architect, if the Architect is not serving as the Initial Decision Maker, of any change in the Contract Sum or Contract Time or both. The initial decision shall be final and binding on the parties but subject to mediation and, if the parties fail to resolve their dispute through mediation, to binding dispute resolution.

§ 15.2.6 Either party may file for mediation of an initial decision at any time, subject to the terms of Section 15.2.6.1.

§ 15.2.6.1 Either party may, within 30 days from the date of an initial decision, demand in writing that the other party file for mediation within 60 days of the initial decision. If such a demand is made and the party receiving the demand fails to file for mediation within the time required, then both parties waive their rights to mediate or pursue binding dispute resolution proceedings with respect to the initial decision.

§ 15.2.7 In the event of a Claim against the Contractor, the Owner may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor's default, the Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

§ 15.2.8 If a Claim relates to or is the subject of a mechanic's lien, the party asserting such Claim may proceed in accordance with applicable law to comply with the lien notice or filing deadlines.

### § 15.3 MEDIATION

§ 15.3.1 Claims, disputes, or other matters in controversy arising out of or related to the Contract except those waived as provided for in Sections 9.10.4, 9.10.5, and 15.1.6 shall be subject to mediation as a condition precedent to binding dispute resolution.

§ 15.3.2 The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement. A request for mediation shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the mediation. The request may be made concurrently with the filing of binding dispute resolution proceedings but, in such event, mediation shall proceed in advance of binding dispute resolution proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order. If an arbitration is stayed pursuant to this Section 15.3.2, the parties may nonetheless proceed to the selection of the arbitrator(s) and agree upon a schedule for later proceedings.

§ 15.3.3 The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.

### § 15.4 ARBITRATION

§ 15.4.1 If the parties have selected arbitration as the method for binding dispute resolution in the Agreement, any Claim subject to, but not resolved by, mediation shall be subject to arbitration which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Arbitration Rules in effect on the date of the Agreement. A demand for arbitration shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the arbitration. The party filing a notice of demand for arbitration must assert in the demand all Claims then known to that party on which arbitration is permitted to be demanded.

§ 15.4.1.1 A demand for arbitration shall be made no earlier than concurrently with the filing of a request for mediation, but in no event shall it be made after the date when the institution of legal or equitable proceedings based on the Claim would be barred by the applicable statute of limitations. For statute of limitations purposes, receipt of a written demand for arbitration by the person or entity administering the arbitration shall constitute the institution of legal or equitable proceedings based on the Claim.

§ 15.4.2 The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.

§ 15.4.3 The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly consented to by parties to the Agreement shall be specifically enforceable under applicable law in any court having jurisdiction thereof.

### § 15.4.4 CONSOLIDATION OR JOINDER

§ 15.4.4.1 Either party, at its sole discretion, may consolidate an arbitration conducted under this Agreement with any other arbitration to which it is a party provided that (1) the arbitration agreement governing the other arbitration permits consolidation, (2) the arbitrations to be consolidated substantially involve common questions of law or fact, and (3) the arbitrations employ materially similar procedural rules and methods for selecting arbitrator(s).

§ 15.4.4.2 Either party, at its sole discretion, may include by joinder persons or entities substantially involved in a common question of law or fact whose presence is required if complete relief is to be accorded in arbitration, provided that the party sought to be joined consents in writing to such joinder. Consent to arbitration involving an

additional person or entity shall not constitute consent to arbitration of any claim, dispute or other matter in question not described in the written consent.

**§ 15.4.4.3** The Owner and Contractor grant to any person or entity made a party to an arbitration conducted under this Section 15.4, whether by joinder or consolidation, the same rights of joinder and consolidation as the Owner and Contractor under this Agreement.



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PART 1 – GENERAL

1.01 AMENDMENTS TO GENERAL CONDITIONS

- A. The General Conditions for this Project shall be the American Institute of Architects' Document A201-2007, "General Conditions of the Contract for Construction, Articles 1 through 15, inclusive, 38 pages, and hereafter referred to as the "General Conditions." Such document is specifically made a part of the Contract Documents.
- B. The following amendments shall modify, delete, and supplement the General Conditions. 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 full force and effect and the supplemental provisions shall be considered as added thereto. Where any Article, Paragraph not so amended, deleted, voided, or superseded shall remain in full force and the order and numbering of subsequent articles, Paragraphs or Subparagraphs shall be changed to read as if in sequence.
- C. Refer to other Division 00 documents for additional supplemental requirements.

PART 2 – AMENDMENT ARTICLES

2.01 ARTICLE 1

- A. Subparagraph 1.1.1: Amend this Subparagraph by deleting the last sentence beginning with the words "Unless specifically enumerated" and substituting the following sentence: "The Contract Documents shall also include the Notice to Bidders, Instructions to Bidders, Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion, Bid Form, Subcontractors and Materials Listing, Contractor's Non-Collusion Affidavit, and all portions of Addenda relating to Bidding Requirements."
- B. Add the following Subparagraph 1.1.7  
"1.1.7 ARCHITECT/ENGINEER"  
"Where the word Architect is used in the AIA A201-2007 it shall be inferred to also include the Design Engineer(s), e.g. Architect/Engineer, Engineer (for Engineer only Administered Projects).
- C. Add the following Section 1.7

"1.7 LITIGATION

1.7.1 All litigation under this Contract must be initiated in Vigo County, Indiana and Contractor consents to the jurisdiction of the Vigo County courts.

1.7.2 Contractor hereby waives its right to a jury trial in any matters litigated in Vigo County.

1.7.3 In any litigation initiated by Contractor, Contractor shall reimburse all attorney's fees and expenses incurred by Owner up to a maximum of \$100,000 provided Contractor has presented its claims as required by this Contract and the Owner has made a good faith offer to resolve any dispute prior to litigation. The determination of a 'good faith offer' shall rest solely with the Architect who will render their opinion in writing to Contractor or Owner upon request prior to Contractor initiating litigation or thereafter as requested. The Architect's decision is binding on Owner and Contractor and admissible in court as determinative of this issue.

1.7.4 In any litigation initiated by Owner against Contractor, provided Contractor was given the opportunity to resolve all issues prior to litigation being initiated and failed to do so through a reasonable offer, as determined by the Architect, then Contractor shall be responsible to reimburse all attorney's fees and expenses incurred by Owner for all litigation as well as for all pre-litigation activities engaged in by the Owner for

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investigating, evaluating, or mediating any claims, issues, or matters related to Contractor.”

2.02 ARTICLE 2

- A. Subparagraph 2.1.2: Delete this Subparagraph in its entirety.
- B. Subparagraph 2.2.5: Amend this Subparagraph by adding “electronically” after the word Documents in the second line.

2.03 ARTICLE 3

- A. Paragraph 3.2: Amend this Paragraph by deleting Subparagraph 3.2.1 in its entirety and replacing with the following new subparagraph 3.2.1 and its subparagraphs:

“3.2.1 By executing the Contract, the Contractor represents to the Owner that:”

“3.2.1.1 The Contractor has a high level of experience and expertise in the business administration construction, management, workplace health and safety supervision and superintendence of projects of similar size and complexity and that it will perform the Work with the care, skill and diligence of such a contractor.”

“3.2.1.2 Contractor and, to the best of its knowledge, its subcontractors are financially solvent, able to pay all debts as they mature and have sufficient working capital to complete the Work and all obligations thereunder.”

“3.2.1.3 The Contractor is able to furnish the plant, tools, materials, supplies, equipment and labor required to complete the Work.”

“3.2.1.4 Contractor is authorized to do business in the State of Indiana.”

“3.2.1.5 Contractor’s execution of the Contract and its performance thereof are within its authorized powers.”

“3.2.1.6 Contractor has:”

“3.2.1.6.1 Studied the Contract Documents, understands their provisions and that that they are sufficiently detailed and complete to permit the Contractor to perform the Work in accordance with the Contract Documents, within the Contract Time and for the Contract Sum.”

“3.2.1.6.2. Inspected the Project site.”

“3.2.1.6.3 Investigated and satisfied itself as to:

“3.2.1.6.3.1 The site and locality where the Work is to be performed and the conditions and difficulties to be encountered, including access thereto.”

“3.2.1.6.3.2 The availability of utilities and access thereto.”

“3.2.1.6.3.3 Conditions affecting transportation, disposal, handling and storage of materials, supplies and equipment.”

“3.2.1.6.3.4 Any materials, supplies or equipment which are to be furnished by the Owner for the Contractor’s use.”

“3.2.1.6.3.5 The type and availability of tools, equipment and facilities to perform the Work.”

“3.2.1.6.3.6 The availability and adequacy of labor and trades, and, if applicable, union wage scales, benefits, working conditions, craft jurisdictions, area practices and collective bargaining agreements affecting the Work.”

“3.2.1.6.3.7 Prevailing weather and climatological conditions.”

“3.2.1.6.3.8 All laws applicable to the Work and to the Contractor.”



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“3.2.1.6.3.9 All other factors which may affect the Contractor’s performance of the Work.”

- B. Paragraph 3.4: Amend this Paragraph by adding Subparagraphs 3.4.4 through 3.4.7 as follows:

“3.4.4 The Contractor shall employ competently trained and experienced engineers and supervisors, who shall coordinate general, mechanical, and electrical Work and crafts with the required construction progress. The Contractor shall exercise complete control over their Subcontractor(s) in a manner which will unite their efforts toward completion of the project as contracted.”

“3.4.5 The Contractor shall continuously maintain adequate protection of all their Work and the Work of Subcontractors from damage and shall hold harmless the Owner and Architect/Engineer from injury or loss arising in connection with this contract, including legal defense costs. The Contractor shall make good any such damage, injury, or loss, except such as may be directly due to errors in the Contract Documents or those caused by agents or employees of the Owner.”

“3.4.6 The Contractor shall be responsible for and shall establish and verify exterior lines and the required elevations of all buildings and structures to be erected at the site.”

“3.4.7 The Contractor shall coordinate and expedite the Work of all lower tier Contractors.”

- C. Paragraph 3.5: Amend this Paragraph by adding Subparagraphs 3.5.1, 3.5.2, and 3.5.3 as follows:

“3.5.1 The Contractor shall warranty that all Work executed under the respective sections will be free from defects of materials and workmanship for the period of one (1) year from the Date of Substantial Completion of the Work or within such longer period of time as may be prescribed by law or by the terms of any applicable special warranty required by the Contract Documents. The Contractor further agrees that they will, at their own expense, repair and replace all such defective Work, and all other Work damaged that becomes defective during the term of the warranty. Where warranties are required, Contractor shall secure warranties in writing from Subcontractors, manufacturers and/or material suppliers addressed to and in favor of the Owner and deliver same to the Owner upon completion of Work. Delivery of warranties shall not relieve the Contractor from any obligations assumed under any other provisions of Contract.”

“3.5.2 Any damage to the building or its contents and/or Work of other Contractors caused by failure of any piece of equipment and/or faulty installation shall be repaired or replaced by the party or parties furnishing the original equipment/installation and paid for by the Contractor at fault.”

“3.5.3 An inspection of the installed Work and/or equipment will be made just before the end of the stipulated warranty period and any installations and/or equipment which, in the opinion of the Architect/Engineer and/or Owner, show undue wear, failure, incorrect operation, or otherwise do not conform to the letter and intent of the Contract Documents shall be repaired or replaced by the Contractor furnishing same at no additional charge.”

- D. Paragraph 3.6: Amend this Subparagraph by adding the words “Unless otherwise provided in the Contract Documents,” to the beginning of this Paragraph.

- E. Paragraph 3.9: Amend this Paragraph by adding Subparagraph 3.9.4 as follows:

“3.9.4 Subcontractors for any other Work shall have a competent superintendent at the site at all times when Work is being performed under their contracts.

- F. Paragraph 3.13: Amend this Paragraph by adding Subparagraph 3.13.1 as follows:

“3.13.1 The Contractor shall prepare an overlay sketch of the construction areas indicating spaces assigned for field office, storage sheds, containers, trailers and field

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shops, and for stockpiles and staging of materials for all trades. This sketch shall be submitted to the Owner and the Architect/Engineer for their information prior to moving any such equipment and materials onto the Project Site.”

- G. Paragraph 3.16: Amend this Paragraph 3.16 adding the following to the end:

“If Work is being executed at locations other than the Project site, the Contractor shall notify the Architect/Engineer where such Work is being executed, and at what time such Work will be ready for inspection, in order that the Architect/Engineer may inspect such Work Prior to its delivery to the Project Site.”

- H. Paragraph 3.18: Amend this Paragraph by adding Subparagraph 3.18.3 as follows:

“3.18.3 The Contractor shall indemnify the Owner and Architect/Engineer for any claim, demand or expense which may be made by reason of:

“.1 Any injury to person or property sustained by the Owner or by any person, firms, or corporations, if caused by the Contractor.”

“.2 Any injury to person or property sustained by any person, firms, or corporations caused by an act or omission of the Contractor or of any person, firm, or corporation directly or indirectly employed by him in connection with this Work, whether the said injury or damage occurs upon or adjacent to the Work.”

“.3 The Contractor, at his own cost, expense, and risk, shall defend any and all actions, suits, or other legal proceedings that may be rendered against the Owner and Architect/Engineer in any such action, suit, or proceedings.”

“.4 The Contractor shall indemnify the Owner and Architect/Engineer from any and all costs resulting from any claim or suits in connection with liens that may be brought or instituted against the Owner. Neither the final payment or any part of the retained percentage of the Contract shall become due until the Contractor has delivered to the Owner a complete release of all liens arising out of the Contract.”

2.04 ARTICLE 4

- A. Subparagraph 4.1.2: Delete this Subparagraph in its entirety.
- B. Subparagraph 4.2.7: Modify the first sentence of this Subparagraph by deleting the words “approve or take” and substituting the word “indicate.”
- C. Subparagraph 4.2.10: Amend this Subparagraph by adding the words “in writing” after the word “agree” in the first sentence.

2.05 ARTICLE 5

- A. Paragraph 5.3: Amend this Paragraph by adding the following sentence thereto:
- “Unless otherwise excepted, nothing contained in this Contract shall create any contractual relationship between any Subcontractor and the Owner.”

2.06 ARTICLE 6 (NO CHANGE)

2.07 ARTICLE 7

- A. Paragraph 7.1: Amend this Paragraph by adding the following new Subparagraph 7.1.4:

“7.1.4 When a change in the Work is contemplated which may affect the Contract Sum or duration of the Work, the Architect/Engineer will issue a ‘Proposal Request’ detailing the Work involved in such proposed change. Upon receipt of such ‘Proposal Request,’ the Contractor shall promptly, but in no case longer than five (5) working days, issue a reply or ‘Change Quotation,’ stipulating the change in cost of Project and/or duration as a result of the proposed change. This issuance of a Proposal Request does not, in any way, authorize commencement of the Work therein described. Should, after review and consultation with the Owner, the Architect/Engineer find the ‘Change Quotation’ by the

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Contractor to be acceptable, the Architect/Engineer will within thirty (30) calendar days issue a written 'Change Order' to the Contractor."

B. Add the following Subparagraph 7.1.5 as follows

"7.1.5 If Contractor proceeds with change order work before receiving a fully executed change order or change directive, then Contractor waives the right to object to the scope of work change, the amount of the change order, and the adjustment, if any, to the time of performance."

C. Amend Subparagraph 7.3.3 by adding the following Subparagraphs:

".5 Time and material."

".6 Extra Work performed under Item .5 above shall be upon the option of the Owner only in the event that the lump sum required under Item .1 is not acceptable."

".7 Extra Work shall be performed for the cost of the labor payroll plus 15% of the labor payroll and the cost of the material plus 5% of the material cost. Said markup fees are intended to compensate for the cost of payroll taxes, insurance of all kinds, all taxes of the Contractor, including State Taxes, Federal Income Tax, Unemployment, and FICA Taxes, as well as all other overhead costs, expenses, and carrying charges whatsoever, including the profit to be derived from such additional Work. Labor payroll is defined as the actual hourly labor cost plus any fringes payable as listed on the wage rate schedule(s) provided as required by the Bidding Documents.

".8 In case such Work is performed by a Subcontractor or a lower tier Contractor with the Owner's consent, the Work shall be marked up as indicated in 7.3.3.7 by the Contractor actually performing the Work. Each succeeding Contractor may mark up their direct labor and material costs as indicated in 7.3.3.7. Otherwise each succeeding Contractor, including the Prime Contractor, may add 5% for handling/coordination. Additional mark-ups of a Subcontractor's costs shall not be permitted.

".9 Costs for bond premiums are allowable provided documentation from the Bonding Company is included detailing the added bond cost premium, the current bond total and the new bond total."

D. Subparagraph 7.3.7: Amend the following:

.1 Delete the text and replace with:

".1 The cost of the labor payroll plus 15% of the labor payroll;"

.2 Delete the semicolon at the end of the sentence and add "plus 5% of the total of the costs;"

.3 Delete the semicolon at the end of the sentence and add "plus 5% of the total of the costs;"

.4 Delete all text following the word bonds in the first line and replace with ",with documentation from the Bonding Company including details of the added bond cost premium, the current bond total and the new bond total;"

.5 Delete the text and replace with:

".5 Additional costs of supervision directly attributable to the change if the change results in supervision of change work at a time outside the normal work hours of the Project."

E. Paragraph 7.3: Add the following new Subparagraphs 7.3.11, 7.3.12, and 7.3.13:

"7.3.11 When extra Work is performed under Item 7.3.3.2 above, said unit prices shall represent the total cost to the Owner and shall not be subject to any additional charges whatsoever."

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“7.3.12 In order to facilitate checking of quotations for extras or credits, all proposals shall be accompanied by a complete breakdown of costs, including labor, material, and subcontracts. Labor and material shall be marked up in the manner prescribed herein. Where cost items consist of major subcontracts, such contracts shall be broken down in a similar fashion.”

“7.3.13 When changes are made that result in a credit to the Owner, the value of the credit will be established by the method indicated in Items 7.3.3.1 or 7.3.3.2”

2.08 ARTICLE 8 (NO CHANGE)

2.09 ARTICLE 9

A. Subparagraph 9.3.1: Amend this Subparagraph by deleting the words “if required” in the third line.

B. Paragraph 9.3: Amend this Paragraph by adding Subparagraph 9.3.4 as follows:

“9.3.4 The Owner will retain, until the Work is at least fifty percent (50%) complete, ten percent (10%) of the amount due the Contractor on account of approved progress payments. At the time the Work is at least fifty percent (50%) completed or thereafter, if the manner of completion of the Work and its progress are and remain satisfactory to the Owner and Architect/Engineer, and in the absence of other good and sufficient reasons, the Architect/Engineer will (upon presentation by the Contractor of Consent of Surety) recommend to the Owner that any remaining approved partial payments be paid in full. Regardless of the Owner’s decision relative to further retainage, all prior retainages that were withheld will be held until completion of the contract Work and all remedial Work, listed as conditions of substantial completion, and following final payment. If retainage is limited to ten percent (10%) of the first fifty percent (50%) of the contract amount, as described above, five percent (5%) will be withheld from payments for all subsequent change orders; therefore, the minimum retainage shall be five percent (5%) of the current contract amount.”

C. Subparagraph 9.6.3: Delete this Subparagraph in its entirety.

D. Subparagraph 9.6.5: Delete this Subparagraph in its entirety.

E. Paragraph 9.7: Delete the text of this Paragraph and replace with the following new Subparagraphs 9.7.1 and 9.7.2

“9.7.1 The Architect shall issue to the Owner a Certificate for Payment within seven calendar days after receipt of the Contractor’s Application for Payment. Upon receipt of the Certificate for Payment (Application for Payment) from the Architect, the Owner will endeavor to make payment to the Contractor within fifteen calendar days. If payment is not made within a reasonable time, then the Contractor may, upon seven additional days’ written notice to the Owner and Architect, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor’s reasonable costs of shutdown, delay and start-up, plus interest as provided for in the Contract Documents.”

“9.7.2 If an Application for Payment is being held for just cause, the Architect shall notify the Contractor in writing of the cause and what remedial action must be taken for the Application for Payment to be released for payment.

F. Subparagraph 9.10.2: Amend this Subparagraph by deleting the word “and” in the eighth line and adding the following after the “Owner” in the eleventh line:

“and (6) the Architect/Engineer has received the required Record Drawings, brochures, manuals, operating instructions, warranties, affidavits, final application for payment, any other special data requirements and has performed a final inspection and confirmed that all items of completion are correct and acceptable at which time he will initiate a ‘Final Completion’ letter establishing the date of Final Completion.”

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2.10 ARTICLE 10

- A. Subparagraph 10.2.2: Amend this Subparagraph by adding the following to the end thereof:

“In the event of conflict between these Contract Documents and any Federal, State, or Local Authority laws, rules, regulations, or requirements, the most stringent requirement shall govern the Work.”

- B. Subparagraph 10.3.1: Amend this Subparagraph by deleting the phrase “and Architect” in the sixth line.
- C. Subparagraph 10.3.2: Amend this Subparagraph by deleting the phrase “and Architect” in the second sentence; deleting the phrase “and the Architect” from the third sentence; and by deleting the words “either” and “or Architect” from the fourth sentence; by replacing the phrase, “and the Architect have” with the word “has” in the fourth sentence.
- D. Paragraph 10.3 add the following Subparagraph 10.3.7

10.3.7 “The Contractor shall also comply with all the safety paragraphs listed in Section 00 30 00 of the Contract Documents. In the event of conflict between 10.3 and Section 00 30 00, Section 00 30 00 shall prevail.”

2.11 ARTICLE 11

- A. Article 11: Insert a new Subparagraph 11.1 and renumber each succeeding Paragraph accordingly:

11.1 See Specification Section 00 20 20 for additional requirements. In the event of conflict between Section 00 20 20 and this Paragraph 11, requirements of Section 00 20 20 shall prevail.

- B. Subparagraph 11.1.1 (renumbered 11.2.1): Amend this Subparagraph by adding the phrase, “and that are acceptable to the Owner,” following the word “located,” in the second line.
- C. Subparagraph 11.1.1 (renumbered 11.2.1): Amend this Subparagraph by adding the phrase, “, Indiana State University, the Indiana State University Board of Trustees and the Architect/Engineer,” following the word “Contractor,” in the second line.
- D. Subparagraph 11.1.1 (renumbered 11.2.1): Amend this Subparagraph by adding Sub-Subparagraphs .9 and .10 as follows:

“.9 Liability insurance shall include all major divisions of coverage and be on a comprehensive basis including:

Premises Operations (including X, C, and U coverage’s as applicable)

Independent Contractor’s Protective

Products and Completed Operations

Personal Injury Liability with Employment Exclusion deleted

Contractual, including specified provision for the Contractor’s obligations under Paragraph 3.18

Owned, non-owned and hired motor vehicles”

“.10 Broad Form Property Damage including Completed Operations: If the General Liability coverage’s are provided by a Commercial General Liability Policy on a claims made basis, the policy date or Retroactive Date shall predate the Contract; the termination date of the policy or applicable extended reporting period shall be no earlier than the termination date of coverage’s required to be maintained after final payment, certified in accordance with Subparagraph 9.10.2.”

- E. Subparagraph 11.1.2 (renumbered 11.2.2): Add the following renumbered Subparagraph 11.2.2.1

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“11.2.2.1 The insurance required by renumbered Subparagraph 11.2.1 shall be written for not less than the following limits, or greater if required by law:

See Section 00 20 20 for Insurance Requirement Levels

F. Subparagraph 11.1.3 (renumbered 11.2.3): Amend this Subparagraph by changing the word “30” to “60” in the second sentence.

G. Subparagraph 11.1.3 (renumbered 11.2.3): Amend this Subparagraph by deleting the last sentence beginning with the phrase, “Information concerning reduction...” And substituting the following:

“The form of the certificate shall be AIA Document G715, SUPPLEMENTAL ATTACHMENT for Acord Certificate of Insurance 25-S (7/90). Contractor shall furnish promptly to the Owner copies of any endorsements that are subsequently issued amending coverage or limits. Certificates of Insurance shall name the Owner (Indiana State University Board of Trustees) and Architect/Engineer as ‘Additional Insured’s.’”

H. Paragraph 11.1(renumbered 11.2): Amend this Paragraph by adding Subparagraph 11.2.5 as follows:

“11.2.5 The Contractor, in connection with the above mentioned Workmen’s Compensation and Occupational Disease Insurance, shall furnish to the Owner, prior to commencement of the Work, duly executed and validated forms as prescribed by the Indiana Industrial Board showing that such insurance is in full force and effect.”

I. Sub-subparagraph 11.3.1.1 (renumbered 11.4.1.1): Amend this Subparagraph by adding the following Subparagraph 11.4.1.1.1:

“11.4.1.1.1: Such Insurance shall not insure against loss due to theft of Contractor’s, Subcontractor’s, Sub-Subcontractor’s tools, equipment, and other personal property. The responsibility to guard against such thefts shall lie with the respective Contractor, Subcontractor, or Sub-Subcontractor whose tools, equipment, and other personal property are susceptible to such thefts.”

J. Subparagraph 11.3.1.3 (renumbered 11.4.1.3): Add the following phrase to the end of the sentence:

The deductible amount shall be \$25,000.00 unless otherwise advised by the Owner.

K. Subparagraph 11.3.9 (renumbered 11.4.9): Delete this Subparagraph in its entirety.

## 2.12 ARTICLE 12

A. Subparagraph 12.2.2.1: Amend this Subparagraph by adding the following sentence to the end:

“Where special warranties of longer duration are required, the Contractor shall secure warranties from Subcontractors, manufacturers and/or material suppliers as applicable, addressed to and in favor of the Owner, and deliver copies of same to the Owner upon completion of the Work. Delivery of said warranties shall not relieve Contractor of any obligation assumed under any other provisions of the Contract.”

## 2.13 ARTICLE 13

A. Subparagraph 13.1: Delete the text in its entirety and replace with the following:

“13.1 Contractor and all Subcontractors are responsible to comply with Indiana Code as it pertains to public works projects. The following are notable requirements set forth in IC 5-16-13, in effect as of July 1, 2015, but are not inclusive of all requirements.”

B. Subparagraph 13.1: Add the following numbered Subparagraph 13.1.1:

“13.1.1 Contractor agrees, and represents to Owner, that at least 15% of the Contract Price (at the time this Agreement is executed) is comprised of any combination of the

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following: 1) Work performed by Contractor's employees; 2) Services supplied directly by Contractor's employees; or 3) Materials supplied directly by Contractor.

- C. Subparagraph 13.1: Add the following numbered Subparagraph 13.1.2:  
"13.1.2 Contractor and all Subcontractors, regardless of tier, shall not pay cash to its employees for Work performed on this public works Project."
- D. Subparagraph 13.1: Add the following numbered Subparagraph 13.1.3:  
"13.1.3 Contractor and all Subcontractors, regardless of tier, shall comply with federal Fair Labor Standards Act of 1938."
- E. Subparagraph 13.1: Add the following numbered Subparagraph 13.1.4:  
"13.1.4 Contractor and all Subcontractors, regardless of tier, shall be in compliance with workers compensation requirements of Indiana Code 22-3-5-1 and Indiana Code 22-3-7-34 and commits worker's compensation fraud if such Contractor or Subcontractor falsely classifies an employee as an independent contractor, sole proprietor, owner, partner, officer, or member of a limited liability company."
- F. Subparagraph 13.1: Add the following numbered Subparagraph 13.1.5:  
"13.1.5 Contractor and all Subcontractor, regardless of tier, shall be in compliance with unemployment compensation system requirements of Indiana Code 22-4-1 through 22-4-39-5."
- G. Subparagraph 13.1: Add the following numbered Subparagraph 13.1.6:  
"13.1.6 Contractor and all Subcontractors, regardless of tier, shall be in compliance with requirements for drug testing of its employees set forth in Indiana Code 4-13-18-1 through 4-13-18-7 if estimated cost of public works Contract is at least \$150,000. With each application for payment the Contractor shall submit an affidavit, dated and signed by the Contractor, that neither they nor, to their knowledge, any of their subcontractors has violated the "Drug Testing Program provision of the Indiana Code."
- H. Subparagraph 13.1: Add the following numbered Subparagraph 13.1.7:  
"13.1.7 Following provisions shall be in effect for Contracts awarded after March 31, 2018."
- I. Subparagraph 13.1.7: Add the following numbered Subparagraph 13.1.7.1:  
"13.1.7.1 Contractor and Subcontractors, regardless of tier, shall preserve its payroll and related records for three (3) years after completion of the project work and such records shall be open to inspection by the Indiana Department of Workforce Development."
- J. Subparagraph 13.1.7: Add the following numbered Subparagraphs 13.1.7.2 and 13.1.7.2.1:  
"13.1.7.2 Recommended Employment of Apprentices"  
"13.1.7.2.1 Owner strongly recommends that Contractor employs apprentices from each building trades craft involved in the Project to the maximum extent feasible. In doing so, the Contractor shall consider whether such apprentices are indentured into a Joint Apprenticeship Training Program or other comparable bona fide apprenticeship training program, registered and certified with the U.S. Department of Labor, Bureau of Apprenticeship and Training and shall use as a guide the Apprenticeship Standards of the Labor-Management Contract for the appropriate jurisdictional area when determining the appropriate ratio of apprentices from each respective craft."
- K. Subparagraph 13.1.7: Add the following numbered Subparagraphs 13.1.7.3, 13.1.7.3.1 and 13.1.7.3.2:  
"13.1.7.3 Contractor's Certification of Authorized Employment (E-Verify Requirements.)"

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“13.1.7.3.1 In accordance with Indiana Code 22-5-1. 7 as amended, each Contractor in any tier of a public works project shall not knowingly employ unauthorized aliens. Every contractor shall enroll in and verify the work eligibility status of all employees hired after June 30, 2015 using the U.S. Citizenship and Immigration Services (USCIS) E-Verify program as defined in IC §22-5-1.7-3, unless the E-Verify program no longer exists.

“13.1.7.3.2 The Prime Contractor shall require their subcontractors who perform work under this Contract to certify to the Prime Contractor that the subcontractor does not knowingly employ or contract with an unauthorized alien and that the subcontractor has enrolled and is participating in the E-Verify program. The Prime Contractor agrees to maintain this certification throughout the duration of the term of a contract with a subcontractor. The Prime Contractor and its sub-contractors at all levels must comply with all provisions of the statute or the Contract is subject to cancellation.”

- L. Subparagraph 13.1.7: Add the following numbered Subparagraphs 13.1.7.4 and 13.1.7.4.1

“13.1.7.4 Non-Collusion Affidavit”

“13.1.7.4.1 The Bidder, by its officers and agents or representatives present at the time of filing their bid, being duly sworn, say on their oaths that neither they nor any of them have in any way, directly or indirectly, entered into any arrangement or agreement with any other bidder, or with any public office of the State of Indiana, of any county or municipality or other public offices whereby such affiance or either of them, has paid or is to pay to such other bidder or public officer any sum of money, or has given or is to give to such other bidders or public officer anything of value whatever, or such affiance of affiance or either of them has not, directly or indirectly entered into any arrangement or agreement with any other bidder or bidders, which tends to or does lessen or destroy free competition in letting of the contract sought for by the attached bids; that no inducement of any form or character other than which appears upon the face of the bid will be suggested, offered, paid, or delivered to any person whomsoever to influence the acceptance of the said bid or awarding of the contract, nor has this bidder any agreement or understanding of any kind whatsoever, with any person whomsoever to pay, deliver to, or share with any other person in any way or manner, any of the proceeds of the contract sought by this bid.”

- M. Subparagraph 13.1.7: Add the following numbered Subparagraphs 13.1.7.5 and 13.1.7.5.1

“13.1.7.5 Non-Discrimination”

“13.1.7.5.1 The Bidder and its Subcontractors, if any, shall not discriminate against any employee or applicant for employment, to be employed in the performance of this Contract, with respect to their hire, tenure, terms, conditions or privileges of employment or any matter directly or indirectly related to employment because of their sex, race, natural origin, ancestry or religion or disability as prohibited under the Americans with Disabilities Act. Breach of this covenant may be regarded as a material breach of the Contract.”

- N. Subparagraph 13.1.7: Add the following numbered Subparagraphs 13.1.7.6 and 13.1.7.6.1

“13.1.7.6 Certification of United States Steel”

“13.1.7.6.1 The Bidder certifies that the Bidder and all Subcontractors will comply with the statutory obligations to use steel products made in the United States.

- O. Subparagraph 13.5.1: Add the following Subparagraph 13.5.1.1:

“13.5.1.1: Prior to commencing the Project the Contractor shall submit a list of all proposed testing companies for the Project to the Architect/Engineer and Owner for approval.”

- P. Subparagraph 13.5.2: Add the following Subparagraph 13.5.2.1



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“13.5.2.1: Prior to testing, unless the testing company has been previously approved, the Contractor shall submit to the Architect/Engineer and Owner the proposed testing company for approval.”

2.14 ARTICLE 14

- A. Subparagraph 14.1.1: Amend this Subparagraph by deleting Sub-Subparagraph .4.
- B. Subparagraph 14.2.1: Amend this Subparagraph by adding a new Sub-Subparagraph 14.2.1.5 as follows:

“.5 becomes financially incapable of completing the Work contemplated by the Contract Documents.”

- C. Add subparagraph 14.2.5 as follows

“14.2.5 Contractor shall be responsible to reimburse Owner all attorney’s fees and expenses incurred by Owner if Contractor is terminated for cause.”

2.15 ARTICLE 15

- A. Subparagraph 15.1.2: Delete the text of this Subparagraph and replace by adding the following Subparagraph 15.1.2.1, Subparagraph 15.1.2.2 and Subparagraph 15.1.2.3:

“Subparagraph 15.1.2.1 Claims must be initiated by written notice to the Architect within 21 calendar days after the occurrence of the event.”

“Subparagraph 15.1.2.2 Notice of a claim must include what the claim is for, when the event occurred causing the claim, the amount of additional time (Project extension) being requested and any financial implications of the claim with sufficient specificity to allow the Owner an opportunity to modify the Project scope to remain within the Owner’s approved budget.”

“Subparagraph 15.1.2.3 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated and had an adverse effect on the scheduled construction.”

- B. Subparagraph 15.1.4 delete this Subparagraph in its entirety.
- C. Subparagraph 15.1.5 delete this and all its subparagraphs in their entirety.
- D. Subparagraph 15.3.2 Delete the text in its entirety and replace with the following:

“15.3.2. If, through acts of neglect on the part of the Contractor, any other Contractor or Subcontractor shall suffer loss or damage on the Work, the Contractor shall agree to settle with such other Contractor or Subcontractor by negotiation or binding dispute resolution, if such other Contractor or Subcontractor will so settle. If such other Contractor or Subcontractor shall assert any claim against the Owner on account of any damage alleged to have been so sustained, the Owner shall notify the Contractor, who shall indemnify and save harmless the Owner against any such claim, including legal defense costs.”

- E. Subparagraph 15.3.3 In the first sentence after the word “fee” add a period and delete the remainder of that sentence.
- F. Paragraph 15.4: Delete this Paragraph in its entirety. Additionally; delete all references and requirements for Arbitration throughout the entire AIA A201-2007 Document and replace with Litigation.

PART 3 – NOT USED

END OF SECTION 00 20 11

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SUPPLEMENTARY GENERAL CONDITIONS

Preface: ***These Supplementary General Conditions supplement and modify AIA Document A201 General Conditions of the Contract for Construction (2007 Edition), General Conditions between the Owner and Contractor.***

PART 1- SUPPLEMENTARY GENERAL CONDITIONS

1.01 DEFINITIONS

- A. "Contract". The Contract or Agreement, the Notice to Bidders, the Instructions to Bidders, the Bid or Proposal, the General Conditions, The Special Conditions, the Specification and Drawings, also any Addenda or the Modifications incorporated in any of the above documents before the execution of the Contract or Agreement.
- B. "Owner": The Indiana State University Board of Trustees.
- C. "Architect/Engineer": the individual or firm hired by the Owner to prepare the Construction Documents and to Administer the Contract.
- D. "Contractor": The person, firm or corporation who, with the Owner, executes the Contract, or the duly recognized assignee thereof.
- E. "Subcontractor": A person, firm or corporation who, under contract with Contractor, furnished material only, labor and materials, or labor only, at the site of or for the project.
- F. "Director": The Director of Department of Facilities Management at Indiana State University, or his duly authorized representative.
- G. "Surety": Any person, firm or corporation which has executed, as surety, the Contractor's performance bond securing the performance of the within contracts.
- H. "Work": Includes both materials and labor.

1.02 BOND

- A. Before any contract made for this work becomes valid, the Contractor shall furnish the Owner a satisfactory performance and payment bonds, in such form as the Owner may prescribe and with such surety or sureties as it may approve each in an amount equal to 100% of the total contract price. All bonds shall be in the form prescribed by the Contract Documents except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in the list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. All bonds signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual's authority to bind the surety. These bonds shall guarantee all labor and material to be as required, the faithful payment of any claim or liens from any cause for which the Contractor or any Subcontractor is liable, including those for labor, materials, utility service, transportation costs and for supplies, equipment, machinery (or the rental thereof).
- B. Licensed Sureties and Insurers
  - 1. All bonds required by the Contract Documents (such as the Bid Specifications, Award Letter, Contract for Construction, etc.) to be purchased and maintained by the Contractor shall be obtained from surety or insurance companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds or insurance policies for the limits and coverages so required. In addition to appearing on Circular 570 U.S. Dept. of the Treasury, such Surety or insurance company shall maintain an A.M. Best's Rating of not less than "A".

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- C. The surety bond shall contain the following paragraph:
  - 1. "The said surety for value received hereby stipulates and agrees that no change, extension of time, alterations, or additions to the terms of the contract, or to the work to be performed hereunder, or the specifications accompanying them, shall in any way affect its obligations on this bond, alteration or addition to the terms of the contract, or to the work or the specifications."

1.03 INSURANCE

**NOTE: The dollar amounts shown in this paragraph are for jobs over \$50,000.  
See footnotes and amounts for jobs less than \$50,000.**

- A. The Prime Contractor(s) shall provide all insurances listed here-in in these Specifications and shall require the Subcontractor(s) to provide the same. The Prime Contractor(s) shall not commence work under this Contract until they have obtained all insurance required by these specifications and until such insurance has been approved by the Owner, nor shall the Contractor allow any Subcontractor to commence work on his subcontract until all similar insurance required of the Subcontractor has been obtained. Policies expiring on a fixed date before final acceptance of the project must be renewed and evidence of such renewal submitted to the Owner before such date.
- B. The Prime Contractor(s) shall furnish the Owner with satisfactory evidence of the insurance required, with satisfactory compliance as determined solely by Owner.
- C. It is solely the responsibility of the Prime Contractor(s) to confirm that the Subcontractor(s) are in compliance with the insurance requirements of these Specifications, to maintain copies of the Subcontractors insurance on file and to be prepared to provide evidence of these insurances to the Owner upon demand.
- D. Insurance Required:
  - 1. Worker's Compensation and Employers Insurance:
    - a. The Prime Contractor(s) shall maintain during the life of this contract Worker's Compensation and Employers Liability Insurance for all Prime Contractor's employees employed at or involved in any manner with the project, and, in case any work is sublet, the Prime Contractor(s) shall require the Subcontractor(s), at their own expense, similarly to provide Worker's Compensation and Employers Liability Insurance for all of the Subcontractor's employees engaged in or involved in any manner with work under this contract. Such Workers' Compensation insurance will be in accordance with the statutory requirements of the State of Indiana, with and including Worker's Compensation for All Other States, if any. The Prime Contractor(s) shall and require Subcontractor(s) to provide insurance coverage equal to that provided under the Worker's Compensation Act, for the protection of the Contractor's employees not otherwise protected. Employer's liability coverage must be maintained in amounts not less than \$500,000/\$500,000/\$500,000. Limits may be provided through a single policy or a primary/excess policy basis.
  - 2. Commercial General Liability Insurance.<sup>1</sup>
    - a. The Contractor shall and require Subcontractors, at their own expense respectively, to maintain during the life of this contract Commercial General Liability Insurance insuring the Prime Contractor and any subcontractor, and owner and any other party required to be insured, from claims for bodily injury, death, personal injury and property damage which may arise from or on account of operations under this Contract, whether such operations be by the Prime Contractor(s) or by any

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<sup>1</sup> For Smaller Contracts, the following limits (including umbrella liability) are permitted:  
Contracts \$25,000 to \$49,999..... \$ 2,000,000  
" \$10,000 to \$24,999..... \$ 1,000,000  
" \$ 9,999 and under..... \$ 500,000

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Subcontractor or by anyone directly or indirectly employed by either of them and the amounts of such insurance shall be as follows:

- \$2,000,000 General Aggregate
- \$1,000,000 Combined Single Limit Bodily Injury, Property Damage
- \$1,000,000 Products/Completed Operations
- \$1,000,000 Personal Injury and Advertising Injury
- \$ 100,000 Fire Damage

The General Aggregate limit shall apply separately, in total, to this project only.

3. Business Auto Insurance<sup>2</sup>:

- a. The Prime Contractor(s) shall and shall require all Subcontractors to maintain at their own expense respectively, at all times during the life of this contract, business auto insurance covering all liability and claims arising from the ownership, use, maintenance, operation, loading or unloading of automobiles anywhere in the United States, in connection with the performance of the Contract, whether such automobiles are owned, hired, or non-owned by the Contractor or Subcontractors.
- b. Such auto insurance shall be written with a limit of not less than \$1,000,000 per occurrence as a combined single limit for Bodily Injury and Property Damage coverage.

4. Umbrella Liability Insurance<sup>2</sup>:

- a. The Prime Contractor(s) shall and shall require all Subcontractors to maintain at their own expense respectively, at all times during the life of this Contract, Umbrella Liability Insurance providing excess coverage over the above specified primary insurance in an amount not less than:
  - \$1,000,000 for contracts \$50,000 to \$99,999.99
  - \$2,000,000 for contracts \$100,000 to \$999,999.99
  - \$3,000,000 for contracts \$ 1,000,000 to \$2,999,999.99
  - \$5,000,000 for contracts over \$3,000,000

E. Additional Insurance Requirements:

1. The Prime Contractor(s) shall and shall require all Subcontractors to include Indiana State University, Indiana State University Board of Trustees and any Architect/Engineer Firm hired by Indiana State University for the Project, as an additional insured on their Commercial General Liability, Umbrella Liability Insurance and Business Auto Insurance policies with regard to this contract.
2. Certificate(s) of Insurance shall include an endorsement of a Waiver of Subrogation in favor of the Owner for Commercial General Liability Insurance, Umbrella Liability Insurance, Worker's Compensation and Employers Liability Insurance and Business Auto Insurance.
3. On Projects in excess of \$1,000,000.00 a copy of the applicable pages from the Contractor's policy shall be provided showing the endorsements listed in paragraphs 1 and 2 of this Item 1.03 E.
4. With regard to the above mentioned Commercial General Liability, Business Auto, and Umbrella Liability Insurance, if in the event of any major change or cancellation of such policy, the Prime Contractor(s) shall and shall require all Subcontractors to give a 30-day advance notice to the Owner.
5. The Prime Contractor(s) shall and shall require of all Subcontractors that the insurance companies must have an A.M. Best's rating of not less than an "A" for projects over \$150,000 and a rating of B+ or higher for projects under \$150,000 and that the insurance

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<sup>2</sup> For Smaller Contracts, the following limits (including umbrella liability) are permitted

Contracts \$25,000 to \$49,999.....	\$2,000,000
\$10,000 to \$24,999.....	\$1,000,000
\$ 9,999 and under.....	\$ 500,000

SUPPLEMENTARY GENERAL CONDITIONS

companies are duly licensed or authorized in the jurisdiction in which the Project is located to issue insurance policies for the limits and coverages so required.

F. Builders Risk Insurance:

1. The Owner agrees to provide property insurance including Builders Risk insurance for property under construction, and all materials and labor at or within 1,000 feet of the site intended for use in the "work" or project. Pursuant to this agreement, Owner hereby affirms the policy contains a waiver of subrogation in favor of the contractor or subcontractors should loss or damage of the type insured against result in loss to covered property; and Owner agrees to release from liability the contractor, to the extent such loss or damage is insured by said policy.
2. Coverage does not extend to personal property, tools, equipment, scaffolding, staging, or similar equipment of the contract or subcontractor(s), or any employees thereof.
3. Notwithstanding the foregoing however, Contractor is responsible for the property insurance deductible of \$25,000 applicable to each covered loss to the work or project. Contractor acknowledges and affirms it will, without delay, pay the deductible, or if the loss remains within the deductible, pay that part of the deductible that equals the loss amount.

G. Indemnification:

1. The Prime Contractor shall and shall require Subcontractors to indemnify the Owner and any other party required to be insured from all claims arising from the failure of the Prime Contractor(s) to require the Subcontractors to provide the insurance required by these Specifications.
2. Notwithstanding any other provision to the contrary, the Contractor(s) agree to indemnify the Owner only for losses due to personal injury, or property damage to the extent caused by Contractor's negligent acts or omissions, or the negligent acts or omissions of Contractor's employees, agents and subcontractors during the performance of this Contract, but not to the extent caused by others. The Contractor shall defend Owner on claims that do not present a conflict of legal theory or fact between Owner and Contractor. Each party shall defend itself on any claim that does present a conflict of legal theory or fact between the parties.
3. Under no circumstances shall either party be liable for any loss, damage or delay due to any cause beyond either party's reasonable control, including but not limited to acts of government, fire, explosion, theft, weather damage, flood, earthquake, riot, civil commotion, war, mischief or act of God.
4. In the event of a strike or work stoppage by Contractor's employees, the Contractor agrees to use its best efforts to fulfill its obligations pursuant to their contract utilizing management and supervisory personnel.
5. Under no circumstances shall either party be liable to the other for special, indirect, or consequential damages of any kind including, but not limited to, loss of profits, loss of good will, loss of business opportunity, additional financing costs or loss of use of any equipment or property, whether in contract, tort (including negligence), warranty or otherwise, notwithstanding any indemnity or other provision to the contrary.

1.04 SUBCONTRACTORS

- A. At the time of Bid the Prime Contractor(s) (Bidder(s)) shall provide the names of the proposed Subcontractors listed in Appendix A of the Bid Form. Prior to the Awarding of the Contract, the Contractor shall submit to the Owner, in writing, the names of all the proposed Subcontractors and major material vendors. All Subcontractors shall be licensed and bonded and shall be held to the same level of experience and qualifications as are required of the Prime Contractor (Bidder) in Section 001000 NOTICE TO BIDDERS last paragraph.
- B. The Prime Contractor shall be responsible for the acts and omissions of his Subcontractors and of persons either directly or indirectly employed by them as he is for the acts and omissions of persons directly employed by him.

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- C. Nothing contained in the Contract shall create any contractual relationship between any Sub-contractor and the Owner, and no Subcontractor will be recognized as a party to the Contract.
- D. The Prime Contractor shall use the Subcontractors, Suppliers, Materials and Equipment as listed in the Bid Form Appendix "A" submitted at the time of Bid. There shall be no changes permitted to this list except as listed in Section 00 10 10 Paragraph 3.14 APPENDIX A, Item B.1.

1.05 DRAWINGS

- A. The drawings referred to in these specifications show such plans and details as are regarded necessary by the Architect/Engineer and/or the Owner to properly illustrate the work required, to estimate the cost of the work, and to complete its construction.
- B. The Architect/Engineer and/or the Owner will from time to time furnish such additional detail and working drawings as may be deemed necessary to interpret and explain the Contract drawings and all such additional drawings shall be of equal force with those mentioned above and shall be considered as forming part of this Contract.
- C. The general character of the work shall be subject to minor modifications when detailed or full sized drawings for such work are prepared.
- D. All lettering on drawings is to be considered a part of the drawings.
- E. All drawings, specifications, etc., are the property of the Owner and shall be returned before the final award is issued, if so requested.

1.06 RELATIONSHIP AND PRIORITY OF DOCUMENTS

- A. The documents comprising the Contract are complementary and what is called for by one shall be as binding as if called for by all. The intention of the Contract is to include all labor, materials, and equipment necessary for the proper execution of the work.
- B. In the case of a discrepancy between the requirements of the Drawings and the Specifications or between Sections of the Specifications:
  - 1. The more stringent shall apply.
  - 2. In equal situations the Specifications or as directed by the Owner prevails.

1.07 PERMITS

- A. The Contractor shall give all requisite notices to public officials, secure and pay for all permits, legal fees or charges, have the work inspected by all proper public authorities, pay all charges connected with such inspections and deliver the proper inspection certificates and all receipts for charges to the Owner.
- B. The Contractor shall give all notices and comply with all laws, ordinances, rules, regulations and orders of any public authority bearing on the performance of the work. If the Contractor observes that any of the Contract Documents are at variance therewith in any respect, he shall promptly notify the Owner in writing, and any necessary change shall be accomplished by the appropriate modification. If the Contractor performs any work knowing it to be contrary to such laws, ordinances, rules and regulations and without such notice to the Architect, he shall assume full responsibility therefore and shall bear all cost attributable thereto.

1.08 SAMPLES

- A. The Contractor shall submit in writing to the Owner for approval samples and shop or installation drawings of the materials he proposes to use, or such other related materials as owner otherwise requests.
- B. Each sample shall be labeled, bearing the name and quality of the material, the Contractor's name, the date and a description of the sample. A letter from the Contractor stating that the samples conform to the requirements of the drawings and specifications shall accompany all such samples. Transportation charges on all samples shall be prepaid.

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- C. Samples and drawings shall be submitted in due time so as to permit proper consideration without delaying the Contractor's operation. Material shall not be ordered until approval is received from the Owner, in writing. The use of any material will be permitted only so long as it remains equal to the approved sample.

1.09 CONTRACTOR'S SUPERVISION

- A. The Prime Contractor shall maintain on the Project site a competent Project Superintendent at all times any work is being performed; either by the Prime Contractor's workers or any Subcontractor's workers. **If the Project Superintendent is not on the Project site the Owner shall be notified immediately. If the Project Superintendent is not on the jobsite, without written prior approval or notification to be away from the jobsite, the Owner may be entitled to a \$1,000 credit for each day or part of the day the Project Superintendent is not onsite while actual work is being performed.**
- B. The Contractor's superintendent shall represent the Contractor during their absence and all directions given the superintendent shall be as binding as if given to the Contractor.

1.11 LAYING OUT AND UTILITY LOCATES

- A. The Contractor shall thoroughly examine the drawings and specifications before commencing work and report to the Owner if any discrepancy, errors, or defect appears, but he shall not be held responsible for their existence.
- B. The Contractor shall lay out his own work.
- C. Prior to any cutting, drilling, trenching, excavating or other earthwork the Contractor shall determine the exact location of all utility lines and appurtenances that could be encountered which are not shown on the drawings as follows.
  - 1. A minimum of forty eight (48) hours prior to commencing work the Contractor shall contact Indiana Locates for all public utility locates.
  - 2. A minimum of forty eight (48) hours prior to commencing work the Contractor shall contact the Project Coordinator for all ISU Utility locates.
- D. Failure to contact for the appropriate locates shall make Contractor solely responsible for all costs incurred to repair all damaged utility lines or appurtenances.
- E. The Contractor shall hand excavate within three (3) feet, or as required by the Utility Company, on either side of a marked utility unless exact depth of the marked utility is known and the planned work will in no way be in close proximity with the utility line or appurtenance.

1.12 MATERIAL AND LABOR

- A. Except as otherwise stipulated, the Contractor shall provide and pay for all materials, labor, tools and equipment necessary for the execution of the work.
- B. The Owner reserves the right to require the Contractor to discontinue the service of any workmen employed on the work whom he deems incompetent, negligent, or otherwise objectionable, and to suspend any portion of the work embraced in the Contract whenever, in his opinion, it would be inexpedient to start or continue such work.

1.13 DEFECTIVE WORK AND MATERIALS

- A. Any materials and workmanship found to be defective, improperly placed, not in strict conformity with the drawings and specifications, or defaced or injured through action of fire or elements, through usage by the Contractor or his employees or from any other cause, shall be removed immediately from the premises and satisfactory materials or work substituted therefore without delay. This shall include making good the work of other Contractors destroyed or damaged by such removal or replacement. The cost of the above replacements shall be borne by the Contractor responsible for the defective work or material.
- B. Should the Contractor in the execution of his work discover any imperfections or errors in the work of other Contractors that would interfere with the proper execution of his contract, he



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shall immediately report this fact to the Owner. Errors or imperfections in the work of other Contractors will in no case excuse installation of imperfect work by this Contractor.

- C. No previous inspection shall be held as an acceptance of defective work or materials or relieve the Contractor from the obligation to furnish sound materials or to perform satisfactory work in accordance with the contract requirements. The final payment shall not relieve the Contractor of the responsibility for faulty materials or workmanship and he shall remedy all such defects, settlements, or other work resulting there from, which shall appear within a period of one (1) year from date of final acceptance or within the period stipulated in certain separate guarantees or bonds required elsewhere in the specifications, whichever may be the longer.
- D. The Owner shall be the sole judge of the materials furnished and the character of work performed.

1.14 RESPONSIBILITY FOR DAMAGE

- A. The Contractor shall be responsible for all damages to life and property due to his action or failure to act when action would reasonably be expected. He shall be responsible for all parts of his work, both temporary and permanent, until the work under his contract is declared accepted by the Owner.
- B. The Contractor shall continuously maintain adequate protection of all his work from damage, and shall protect the Owner's property and all adjacent property from injury in connection with the Contract.
- C. The Contractor shall be held responsible for damage to work of other Contractors that is the result of his operation.
- D. Should the Contractor believe that the work shown by the drawings or specifications is not correct when executed to obtain safe and substantial results, or if any discrepancy appears, it is his duty to immediately notify the Owner in writing, stop work on same, and await written instruction.

1.15 INDIANA SALES TAX

- A. Indiana State University is a Tax Exempt Institution and Indiana Sales Tax for products permanently incorporated in work shall not be included as part of the Bid or on any Application for Payment.
- B. Contractor Responsibilities:
  - 1. Pay Indiana Sales Tax on all non-exempt purchases and provide the Owner with detailed documentation of all taxes of non-exempt items invoiced on their Application for Payment. Documentation shall be provided with their Application for Payment at the time of first billing of each taxable item.
  - 2. Upon completion of work, file with Owner notarized statement that all purchases were made under their exemption certificate where entitled to be exempt.
  - 3. Pay legally assessed penalties for improper use of the exemption certificate number.

1.16 CLEANING UP

- A. The Contractor shall at all times keep the premises free from accumulations of waste material or rubbish.
- B. When directed by the Owner, the Contractor shall clear out and remove any rubbish that may constitute an obstruction to the progress of the work.
- C. At completion of the contract, the Contractor shall remove from the premises all rubbish and surplus material, and shall repair any damage to his work no matter by who caused, and shall leave the premises clean and in perfect repair and order.

SUPPLEMENTARY GENERAL CONDITIONS

## 1.17 NON-DISCRIMINATION CLAUSE

- A. "Pursuant to the requirements of Indiana Code 22-9-1-10 and 5-16-6-1, Contractor and his Subcontractors may not discriminate against any employee or applicant for employment to be employed in the performance of such contract, with respect to their hire, tenure, terms, conditions or privileges of employment or any matter directly or indirectly related to employment because of their sex, race, natural origin, ancestry or religion or disability as prohibited under the Americans With Disabilities Act. The contractor and subcontractor, if any, agrees to comply with all the provisions contained in the Equal Opportunity Clause quoted in Executive Orders No. 11246 and No. 11375. In addition, the contractor shall cause this Equal Opportunity Clause to be included in the subcontracts or purchase orders hereunder unless exempted by rules, regulations and orders of the Secretary of Labor issued pursuant to Section 204 of the Executive Orders No. 11246 and No. 11375 as amended. Breach of the covenant may be regarded as a material breach of contract."

## 1.18 PUBLIC RELATIONS

- A. Indiana State University is an Affirmative Action Institution. Any inappropriate actions toward any Indiana State University student, faculty or staff member by any Contractor's Employee shall result in the employee being told to leave the Campus of Indiana State University immediately. This employee shall not be allowed to return to work on the Project for the duration of the Project or longer. Repeated offences by a Contractor's employees may result in disqualification of the Contractor for this and future Indiana State University Projects.

## 1.19 "OR APPROVED EQUAL" CLAUSE

- A. Unless the Specifications indicates that substitutions are not allowed, whenever a material or article required is specified or shown on the plans by using the name of the proprietary product or of a particular manufacturer or vendor, any material or article which will perform adequately the duties imposed by the general design will be considered equal and satisfactory providing the material or article so proposed is of equal substance and function in the Architect/Engineer and Owner's opinion. It shall not be purchased or installed without written approval. Requests for substitution prior to Bidding shall be as per Section 001010 INSTRUCTIONS TO BIDDERS Item 1.08
- B. Complete descriptive information, specifications and samples or sample material must be submitted at the time the proposal is submitted. In addition, a list of projects with dates and contact persons must be submitted at the time the proposal is submitted showing where the proposed alternate material or article has been installed or used. Failure to submit information as requested will be cause for rejection of the Bid submitted.

## 1.20 VERIFYING MEASUREMENTS

- A. The Contractor shall verify all measurements on the site and be responsible for any mistakes he may make and their results. If the Contractor discovers any discrepancy, in figures on the drawings, he shall report same to the Architect/Engineer and Owner before proceeding with any work affected by the discrepancy and shall be held responsible for results should he fail to make such reports.

## 1.21 EXTRAS

- A. Without invalidating the Contract, the Owner may order extra work or make changes by altering, adding to, or deducting from the work, the Contract sum being adjusted accordingly, and the consent of the Surety being first obtained where necessary or desirable. All work of the kind Bid upon shall be paid for at the price stipulated in the proposal, and no claims for any extra work or materials shall be allowed unless the work is ordered in writing by the Owner, and the price is stated in such order.
- B. Requests for compensation, for previously approved Change Orders omitted from an Application for Payment, received sixty (60) calendar days after Owner receipt of the Final Application for Payment (Release of Retainage) shall not be honored.

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1.22 GENERAL GUARANTY

- A. Neither the final certificate of payment nor any provision in the Contract documents nor partial or entire occupancy of the premises by the Owner shall constitute an acceptance of work not done in accordance with the Contract documents or relieve the Contractor of liability in respect to any express warranties or responsibility for faulty materials or workmanship. The Contractor shall remedy any defects in the work and pay for any damage to other work resulting there from, which shall appear within a period of one (1) year from the date of final acceptance of the work, unless a longer period is specified.

PART 2 – NOT USED

PART 3– NOT USED

END OF SECTION 00 20 20

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SUPPLEMENTARY GENERAL CONDITIONS

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ISU SPECIAL REQUIREMENTS AND INFORMATION

## PART 1- SPECIAL REQUIREMENTS

## 1.01 BARRICADES

- A. ISU will provide barricades during the initial closure of a construction site. However, once the Contractor mobilizes, ISU will remove the barricades, and Contractor shall replace them with his own. If additional barricades are required during the construction phase, Contractors shall provide them at their expense.

## 1.02 BURIED UTILITIES

- A. All Direct Buried Utility Lines and Utility Duct Banks will be marked by use of the appropriate marker tape continuously installed a minimum of twelve (12) inches above said utility line or duct bank. Marker tape shall be a minimum of six (6) inches wide.

## 1.03 REMOVAL AND RE-INSTALLATION OF EQUIPMENT

- A. The Owner is not responsible for the removal or re-installation of any equipment necessitated by this work.
- B. All electrical disconnects and reconnects of equipment necessitated by this work shall be performed by a licensed bonded Electrical Contractor hired by the Contractor to perform this work. The Owner will assist in locating the power source but will not be responsible for the actual performance the electrical work.

## 1.04 PRIME CONTRACTOR RIGHT OF SALVAGE

- A. The Owner has the first right of salvage of any items not slated for re-use on every Project.
- B. Should the Owner waive their right for salvage for any item not slated for re-use or designated in for recycling; then these items become the property of the Prime Contractor.
- C. The Prime Contractor at their discretion may grant to others the right to salvage items not slated for re-use and this may be used to comply with the recycling requirements as long as records are kept.
- D. However; once an item has been placed in a dumpster or any other trash receptacle no one is allowed to enter a dumpster or search through a trash receptacle for the purpose of removing items for salvage while these trash containers are on the campus of Indiana State University.
- E. The Prime Contractor shall protect these trash containers by use of a six (6) foot high chain link fence enclosure around the trash container(s) to prevent any person from gaining access to the trash containers for actions prohibited by this item.

## 1.05 CERTIFICATE OF INDUSTRIAL BOARD

- A. The Contractor shall furnish a certificate of insurance from an insurance company acceptable to Indiana State University evidencing that the Contractor has complied with the Indiana Worker's Compensation Law.

## 1.06 COVID 19 REQUIREMENTS FOR ISU PROJECT WORK

- A. Effective March 5, 2022 the wearing of masks is optional on the Campus of Indiana State University (ISU) and in ISU buildings. Contractor's employees will no longer be required to wear masks when working in occupied ISU buildings unless the occupant of the space where the work is being performed requests the Contractor's employees to wear a mask. The Contractor's employees shall have a mask available to put on if the occupant requests masks be worn in their space. The same applies to Vendors visiting the work space.
- B. Any Contractor and Subcontractor's employees exposed to Covid 19 shall be required to comply with CDC and State of Indiana guidelines, whichever is more stringent, for quarantine/isolation and shall not return to work on the Project until medically cleared to

ISU SPECIAL REQUIREMENTS AND INFORMATION

return to work. The effected Contractor and Subcontractor shall notify the Owner in writing of any Covid 19 incidents.

## 1.07 CONTRACTOR PUBLIC STATEMENTS

- A. No person or entity that enters a contract with the University shall be permitted to make any public statement in such contracting party's official capacity as a contractor of the University except where such public statement: a. relates to the business or operation of the University, or to a University sponsored event; or b. has been approved by the Board of Trustees of the University. 620.2.11.1. Certain Public Statements. This Policy 620.2.11 Contractor Public Statements shall not in any way prohibit a contracting party's exercise of any protected expressive activity that is not made in such contracting party's official capacity as a contractor of the University.

## 1.08 CAMPUS TOBACCO POLICY

- A. Effective in 2011 the following became the ISU smoking policy:
1. The sale of tobacco products is prohibited on university-owned, operated, or leased property.
  2. The use of smoking tobacco products is prohibited on university-owned, operated, or leased property.
  3. The use of smoking tobacco products is permitted in privately owned vehicles and in designated smoking areas on campus.
  4. Any exceptions for the use of smoking tobacco products on university-owned, operated, or leased property must be approved by the President or Provost.
  5. Enforcement of this policy will depend on the cooperation of all faculty, staff, and students not only to comply with the policy, but also to encourage others to comply, in order to promote a healthy environment in which to work, study and live.
  6. Observation of violation of the policy should be reported to Public Safety at 812-237-5555. Follow up for violations of the policy should be referred to the appropriate administrative office for review and action for faculty through the office of Academic Affairs, for staff through Human Resources and to the Dean of Students for students.
- B. Amendments to this policy for Contractors
1. Delete item 5 in its entirety and replace with the following:  
"Enforcement of this policy will depend on the cooperation of the Contractors and their employees to comply with the policy and encourage others to comply in order to promote a healthy environment in which to work".
  2. Delete item 6 in its entirety and replace with the following:  
"Observation of violation of this policy should be reported to the Contractor's Project Superintendent and/or the Owner's Project Manager. Contractor's employees repeatedly violating this policy may be asked to leave the Campus of Indiana State University and not be allowed to continue work on the Project".
  3. Add the following item 7:  
"For major construction or renovation Projects (as determined solely by the Owner) the Owner shall designate a Contractor's smoking area near or within the boundaries of the job-site; unless the Prime Contractor(s) chooses to declare the entire Project job-site as non-smoking. Under no circumstances shall smoking be permitted within a building under construction or renovation.
- C. Additionally on construction sites on university-owned, operated, or leased property the use of smokeless tobacco products is prohibited.

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## 1.09 PARKING REGULATIONS

- A. Beginning January 2018, construction employees will be required to park with a Construction Permit in Lot N (11<sup>th</sup> and Chestnut), Lot K (1<sup>st</sup> and Chestnut) or Lot I (3<sup>rd</sup> and Tippecanoe) when regular classes are in session. Contractors will be allowed to request an appropriate number of permits depending upon the project size for "core campus" parking. These permits should be used for carpooling or transporting employees to/from the construction and the construction parking lots. Contractors will also be allowed to have 2 foreman construction permits per project which will allow the foreman direct access to the construction project.
- B. When regular classes are not in session (i.e. weekends, Fall Break, Winter Recess, and summer sessions [the Monday after commencement thru one week before move-in]) contractors and their employees will be allowed to park in any regular/open lot on campus with a construction permit unless the lot is reserved for an event.

## 1.10 ISU ENVIRONMENTAL CODE FOR CONTRACTORS

- A. Prior to starting any work, Contractor shall provide to the Owner a written document containing emergency procedures in case of:
  - 1. Liquid spills or leaks
  - 2. Release of gases or toxic vapors
  - 3. Excessive smoke
- B. This document shall contain but not be limited to:
  - 1. Emergency medical, fire, and police phone numbers including the ISU University Police.
  - 2. EPA phone numbers
  - 3. IDEM phone numbers
  - 4. Location of Material Safety Data Sheets.
- C. Prior to using any chemical or hazardous material the contractor shall provide the Owner with a copy of Material Data Safety Sheets covering the chemical or hazardous material.
- D. Contractor shall not burn or bury waste material on campus, or discharge any hazardous, or undesirable materials to sewers, or release toxic materials to the air.
- E. Contractor shall provide adequate exhaust ventilation for work area when generation of air contaminants is likely, i.e., painting, handling flammable liquids, welding, cutting, applying adhesives, etc.
- F. Contractor shall have at the job site Material Safety Data Sheets (MSDS) covering all chemicals and hazardous materials to be used in the work area. MSDS are to be available to workers and ISU personnel during normal working hours. Contractor shall use proper procedures based on MSDS when handling hazardous chemicals and materials.
- G. Contractor shall provide vacuum breakers or backflow preventers at each location where he utilizes building water supply.
- H. Any Contractor employee who deliberately interferes with environmental monitoring shall be removed from the project immediately.
- I. Contractor shall prevent fumes from welding, cutting, etc. and dust generated by construction from entering areas outside the work area by erecting plastic film barriers, sealing openings and ducts, and installing exhaust fans as required.
- J. Air contaminants in the work area shall not exceed OSHA regulations.

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## 1.11 ISU SAFETY CODE FOR CONTRACTORS

## A. General:

1. All work performed by contractors shall be done in accordance with all applicable Federal, State and Local laws, codes, and regulations and recommendations of Factory Mutual Engineering and Research (FM).
2. Any safety hazard or unsafe act recognized by the Owner shall be reported to the Contractor responsible for job coordination. The safety hazard shall be corrected in a timely manner dictated by the severity of the safety hazard or unsafe act.
3. Contractors shall remove all rubbish from the job site daily.
4. All construction materials shall be protected from wind damage. Materials shall be secured to prevent them from becoming airborne with subsequent injury to personnel or damage to property.

## B. Communication:

1. Contractor's job supervisors, or designated safety persons, must carry at all times a cellular phone to facilitate communication between the job site and the ISU University Police and Facilities Management Department. The cellular phones must remain on the job site during regular working hours. Contractor(s) shall report to the designated representative of ISU, or to ISU Police, any safety problem, code infraction, personal injury, or damage to ISU property. Report shall be made immediately after such occurrence.

## C. Fire Protection:

1. Contractors shall provide a type "ABC" fire extinguisher for each work crew.
2. Extinguishers are to be kept within easy reach of each work crew and never farther than 10 feet from some worker. Inspection tags on extinguishers shall indicate the date of last inspection.
3. Contractor's supervisor shall keep torch cutting operations to a minimum by instructing personnel to use power saws, pipe cutters, etc. It shall be the duty and responsibility of the Contractor performing any cutting or welding to comply with the safety provisions of the National Fire Codes (NFC) pertaining to such work.
4. Contractor shall adhere to Factory Mutual Engineering and Research (FM) "Cutting and Welding" permit system. Permits are available through the Office of Environmental Safety's Fire Specialist Office at 812-237-4020.
5. Prime Contractor shall provide a one hour fire watch at the end of each workday when any cutting or welding occurred to assure that no possibility of fire exists from any work performed that day.

## D. Safety Program: Prior to starting any work the Contractor shall submit to ISU a written safety program for the project including but not limited to:

1. Occupational Health & Environmental Controls
  - a. Personal Protective Equipment
  - b. Fire Protection & Prevention
  - c. Hand & Power Tools
  - d. Ladders & Scaffolds
  - e. Motor Vehicles and Mechanized Equipment
  - f. Accident Prevention
  - g. Safety Inspections
  - h. OSHA Inspections



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2. Instruct all of his personnel as to location of emergency telephone(s).
  3. Instruct all his personnel as to location of fire alarm (pull) stations.
  4. Instruct all of his personnel to follow FM "Cutting and Welding Permit Systems" and emphasize the need to advise ISU's representative 24 hours prior to doing any welding, cutting, brazing, etc.
  5. Instruct all his personnel to advise ISU representative prior to doing any welding, cutting, or brazing on or near a roof structure.
  6. Instruct all personnel as to location on the job site of a copy of OSHA 29 CFR, Part 1926.
  7. Instruct all of his personnel as to location of first aid supplies.
- E. Flammable Storage:
1. Flammable or combustible liquids (paints, thinners, asphalt, gasoline, and tar or similar materials) shall be stored and handled as per NFPA 30, 4-5.5, and OSHA Construction Standard 1926.152. Quantities of flammable paints, etc., inside building work areas shall not exceed the amount to be used in one day.
  2. Containers of Class I liquids that are stored outside of an inside liquid storage area shall not exceed a capacity of 1 gallon, except safety cans shall be permitted up to 2 gallon capacity. Not more than 10 gallons of class I and class II liquids combined shall be stored in a single fire area outside of an approved storage cabinet or an inside liquid storage area unless in safety cans. Not more than 25 gallons of class I and class II liquids combined shall be stored in a single fire area in safety cans outside of an inside fluid storage area or an approved storage cabinet. Not more than 60 gallons of class IIIA liquids shall be stored outside of an inside liquid storage area or outside an approved storage cabinet.
  3. Rags saturated with flammable liquids shall be placed in approved cans and removed from the work site at the end of the work shift.
- F. Site Control: Contractor shall be responsible for securing the job site at all times and have personnel on call 24 hours per day for emergencies. Contractors shall protect their equipment and materials and ISU property from theft. Contractors shall secure doors, and openings including roof openings.
- G. Prior to a multiple day shutdown the Contractors shall:
1. Remove all debris and leave the premises broom clean.
  2. Shut off all unnecessary electric power and water supplies.
  3. Remove all flammable liquids from the work site.
  4. Secure small tools in gang boxes.
  5. Leave drives open for emergencies.
- H. Temporary Electrical Service:
1. Temporary electrical service shall be provided by a licensed, bonded electrical contractor.
  2. All extension cords shall be protected from abrasion and traffic. Multiple lengths of extension cord shall be connected with waterproof twistlock type connectors. Any electrical service over 115 volts shall be marked accordingly. All electrical power supplied from building service or portable generators shall have ground fault protection as part of the circuit.
  3. Portable generators or welders driven by internal combustion engines shall not be located inside the building. Positioning of this equipment outside the building shall be such that engine exhaust shall not enter the workplace or adjacent buildings.

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I. OSHA Reporting:

1. Contractors shall complete an OSHA 106 form on all reportable occupational injuries and illnesses for each of their job locations on the ISU campus. This requires posting the information from the initial accident report on a master log (OSHA 200) form within six working days after the accident occurs. This form must be kept available for OSHA Compliance Safety and Health Office and ISU review.
2. See OSHA Regulations 29 CFR Part 1904, "Recording and Reporting Occupational Injuries and Illnesses"

1.12 FIRE SUPPRESSION SYSTEM REGULATIONS

- A. Prior to closing any fire suppression system valve or in any way making a fire suppression system inoperable the Contractor shall contact the Fire Specialist's Office at 812-237-4020 to obtain a FM Global Red Tag so the impairment to the system may be reported.
- B. When the work is complete the Contractor shall immediately contact the Fire Safety Specialist to report the work is complete so the red tag may be removed and FM Global notified that the system has been returned to normal operation.

1.13 ELECTRICAL SAFETY REGULATIONS

- A. OSHA *Control of Hazardous Energy Lockout/Tagout Regulations* apply to all work performed on the Campus of Indiana State University. These Regulations are available for review on the OSHA Internet Website at <http://www.osha.gov/SLTC/controlhazardousenergy/index.html> . Any individual who removes another's lock or tag shall be ordered to leave Indiana State University and shall be disqualified from any future work at Indiana State University.
- B. High fault currents, in excess of 45kA, exist at certain points on electrical systems at Indiana State University. Employing Contractors shall make their employees working on campus electrical systems aware that this condition exists.
- C. No individual shall be permitted to install or service any energized circuit, equipment or apparatus where voltages greater than 100 volts to ground is present unless another individual is present.
- D. No individual shall be permitted to operate or service any main or feeder main overcurrent protection device, whether group mounted or individually mounted, unless another individual is present.
- E. Deliberately shorting a branch circuit to ground to locate a branch feeder breaker is strictly prohibited.
- F. Any individual observed in violation of Regulations "C", "D" or "E" may be asked to immediately leave the workplace and/or their employer may be fined based on the following scale. Violations may apply to one or multiple employees.
 

• 1 <sup>st</sup> violation	Notice of Violation Warning Placed in Employing Firm's Work Record File
• 2 <sup>nd</sup> violation	\$100.00
• 3 <sup>rd</sup> violation	\$250.00
• All subsequent violations	\$500.00 per incident
- G. **Repeated violations may be cause to disqualify the individual and/or employing firm from any other future work on the campus of Indiana State University.**

1.14 FIRE ALARM SYSTEM COORDINATION WITH PROJECT WORK

- A. An automatic fire detection system may in operation in areas of work. Prior to start of Work the Contractor shall verify with the Owner if devices are present in the Work area.

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- B. Contractor shall coordinate with Owner for the shut down and reactivation of automatic fire detection devices in work areas based on the following procedures.
1. Prior to 2:30pm on the day before work is scheduled the Contractor shall contact either Pat Teeters at 812-237-8187 (Office) or 812-230-6141 (Cellular) to request fire alarm devices be disabled. If no answer, call Brad Welker at 812-237-8109 (alternate contacts). The Contractor shall provide exact work location, the time the devices are required to be disabled by and a means by which to contact the Contractor the next day, i.e. pager or cellular phone number. It is permissible to leave a "voice mail" of the required information.
  2. Prior to starting work the next day the Contractor shall contact Pat Teeters (preferred contact) or Brad Welker (alternate contact) to verify if the required devices are disabled. Please listen carefully to the voice mail announcement for information in the event of no answer.
  3. Prior to leaving the job-site at the end of workday or by 2:30pm the Contractor shall contact one of the aforementioned individuals to report clearance to reactivate the devices for the evening and what, if any, devices require disabling for the following workday.
- C. Failure to follow these procedures may result in fines being levied on the Contractor based on the following schedule.
- 1<sup>st</sup> failure to call and schedule in advance – Warning.
  - Any subsequent failure to call and schedule in advance – \$10.00 per occurrence
  - 1<sup>st</sup> failure to call resulting in activation of fire alarm system – Warning or \$100.00, dependent on situation as determined by the Owner.
  - Any subsequent failure to call resulting in activation of fire alarm system - \$100.00 per occurrence.

## 1.15 INSPECTION

- A. At the conclusion of the entire work encompassed in this contract, written notice requesting inspection shall be submitted to the Owner at least ten (10) days prior to the anticipated inspection date.

## 1.16 PAYMENT AND FINAL ACCEPTANCE

## A. Anticipated Draw Schedule

1. For any Project in excess of \$500,000.00 the Contractor shall submit an anticipated monthly drawdown schedule.
2. This schedule shall be submitted within fourteen (14) calendar days after Award of Contract to:

The Office of the Senior Vice President for Finance and Administration  
Rankin Hall Suite 210  
Terre Haute, IN 47809

- B. Applications for Payments shall be submitted on AIA Application for Payment form G702 with Continuation Sheet G703 (or on a form approved by the Owner). While no set date is required for Applications for Payment, the application shall be submitted on a regular monthly basis for labor and materials permanently installed in the work, for material stored on site and for properly insured materials stored off-site under the following conditions:
1. For purposes of making periodic estimates, the Contractor shall furnish an itemized breakdown of his contract amount, distributed according to different classes of work. In making application for payments, the Contractor shall show, each period, the percentages of completion of each class.

ISU SPECIAL REQUIREMENTS AND INFORMATION

2. Contractor shall send three (3) copies for each Application for Payment. In lieu of submitting "hard" copies it is permissible to scan and e-mail the pay applications. See 1.18 B of this Section for list of e-mail recipients.
3. The Owner will make partial payment to the Contractor on the basis of a duly certified, approved estimate of the work performed during the preceding calendar month by the Contractor within 15 days after receipt by the Owner.
4. Payment will be made on balance due on labor and materials installed permanently in the work to within 90% of estimated value, and not to exceed 90% of the value of materials delivered to the site which are not subject to damage by exposure to the elements.
5. Stored materials and equipment offsite: The Owner will make payment for materials and equipment store offsite under the following conditions.
  - a. The Contractor requests in writing to the Architect/Engineer/Owner for payment on offsite stored materials and equipment.
  - b. The Architect/Engineer/Owner is given access to the offsite storage facility for purposes of inspection and verification of the stored materials and equipment. Any material or equipment not properly stored or protected shall not be approved for payment.
  - c. The Contractor shall provide to the Architect/Engineer/Owner a current Certificate of Insurance on the remote storage facility. This insurance shall remain in force for the duration of the storage of the stored materials and equipment at the remote location.
6. The Owner, if conditions in its opinion warrant, has the right to withhold, in addition to retained percentages, such an amount or amounts from the payment to the Contractor as may be necessary to pay just unpaid claims for labor and services rendered and materials furnished in connection with the work.
7. The Owner will not approve for payment on any estimate, the value on any materials which, in his opinion, does not meet the contract requirements.
8. At the conclusion of installation and satisfactory inspection by the Owner, the work shall be acceptable for payment of an amount equal to ninety-five (95%) percent of the total contract amount.
9. Reduction or Limitation of Retainage:
  - a. At the sole written discretion of Indiana State University, if acceptable progress is made, at fifty percent (50%) completion of the Contract Sum the remaining Retainage may be reduced to 0%.
  - b. Any subsequent Change Orders after the reduction of Retainage shall have 5% Retainage withheld.
10. **Requests for compensation, for previously approved Change Orders omitted from an Application for Payment, received sixty (60) calendar days after Owner receipt of the Final Application for Payment (Release of Retainage) shall not be honored.**
11. Final payment will be due and payable the later of sixty-one (61) days from date of receipt of the Final Application for Payment or after the Contractor has completed all punch list items, certified that all Subcontractors and Suppliers have been paid, and all claims, including the Contractor's, have been resolved. Before issuance of the final payment, the Contractor shall furnish an affidavit (Final Waiver of Lien) as evidence that there are no claims on account of the Contract, outstanding liens of claims for materials furnished, or labor performed on the work. The final payment shall constitute the acceptance of the work by the Owner, except as to work thereafter found to be defective. The date of such payment shall be regarded as the date of final acceptance of the work.
12. Warranty: The Warranty Period shall be per AIA A201-2007 Article 3 Paragraph 3.5 as amended by Specification Section 00 20 11 Amendments to General Conditions.

ISU SPECIAL REQUIREMENTS AND INFORMATION

## C. ACH Payments

1. In an effort to expedite Contractor payments Indiana State University requests the Contractor set up an ACH account for Project Payments. Contact Catherine Procarione in the ISU Office of the Controller at 812-237-3525 to set up this account.
2. If the Contractor currently has an ACH Account with Indiana State University it is not necessary to set up an account for each Project. It is solely the responsibility of the Contractor to maintain accurate Banking information on file with the ISU Office of the Controller.

## D. Special provisions regarding Retainage and Escrow:

1. The laws of the State of Indiana (IC 5-16-5.5-3 as amended) contain certain provisions regarding retainage, bonds and payment of Contractors and Subcontractors. The Contracts and Subcontracts entered into pursuant to these instructions to Bidders shall be governed by those provisions with respect to Contracts in excess of \$200,000 entered into between a Contractor and the Indiana State University Board of Trustees.
2. These provisions require, among other things, that the amounts retained by the Owner from the contractor pursuant to retainage provisions be placed in an escrow agreement to be executed by the Contractor. Pursuant to these provisions, the successful Bidder shall be required to execute an escrow agreement between the Contractor and the Owner.
3. This escrow agreement shall have no application to payment withheld by the Owner pursuant to provisions of the Construction Contract intended to protect the Owner from loss on account of defective work not remedied; claims filed on reasonable evidence; failure of the Contractor to make payments when due to subcontractors or for material or labor; reasonable doubt that the contract can be completed for the balance then unpaid; damage to another contract; failure or refusal of the Contractor to prosecute the work in strict compliance with the above process schedule; or similar provision.
4. In addition, each successful Bidder will be required to comply with all applicable provisions of the statute referred to above with respect to each of his Subcontractors (as the term 'Subcontractor' is defined in the statute referred to above).
5. The Contractor shall contact Kathy Abernathy in the Office of the Senior Vice President for Finance and Administration at (812)-237-3554 to set-up this escrow account.
6. Should a Contractor fail to execute an Escrow Agreement between the Contractor and the Owner (Indiana State University Board of Trustees) the Contractor waives all claims for any interest the Contractor would have accrued had an Escrow Agreement been executed.

## 1.17 CONTRACTOR'S BID

- A. Contractor shall submit Bid for Base Bid and any Alternate Bids as listed in Section 00 20 00.

## 1.18 INVOICING

- A. All invoices and/or Certificates of Payment must be addressed to:

Indiana State University  
 Department of Facilities Management  
 951 Sycamore Street  
 Terre Haute, IN 47809  
 Attention: Scott Tillman

- B. It is permissible to submit applications for payment electronically via e-mail. E-mail copies of the Application for Payment to:

1. Pat Teeters [patrick.teeters@indstate.edu](mailto:patrick.teeters@indstate.edu)
2. Scott Tillman [scott.tillman@indstate.edu](mailto:scott.tillman@indstate.edu)

ISU SPECIAL REQUIREMENTS AND INFORMATION

**Do not send Applications for Payment to the ISU Accounts Payable Office**

- C. A Partial Waiver of Lien shall be submitted with every Application for Payment until the final Application for Payment (Release of Retainage) when a Final Waiver of Lien shall be submitted.

1.19 SITE LOCATION(S)

- A. **New Theater Building, 536 N 7<sup>th</sup> Street, Terre Haute, IN 47809**

1.20 PROJECT CONTACT

- A. All questions regarding this Project shall be addressed to:

**Scott Tillman**

ISU Department of Facilities Management

951 Sycamore Walk

Terre Haute, IN 47809

Ph 812-237-8198 Cell 812-878-4251 E-mail [scott.tillman@indstate.edu](mailto:scott.tillman@indstate.edu)

PART 2 – NOT USED

PART 3 – NOT USED

END OF SECTION 00 30 00

01 10 00  
SUMMARY OF WORK

PART 1 - GENERAL

1.01 DESCRIPTION

- A. The project is located on the campus of Indiana State University at New Theater Building, 536 North 7<sup>th</sup> Street, Terre Haute, IN 47809.

1.02 RELATED SECTIONS

- A. Division 00 Sections
- B. Division 01 Sections
- C. All Division 02-33 Sections as applicable

1.03 SCOPE OF WORK – BASE BID

- A. The following, but not limited to, is included in the Base Bid Package:
  - 1. Renovation of existing Dressing Rooms/Rest Rooms
    - a. Selective demolition.
    - b. Installation of new flooring finishes and new ceiling.
    - c. Painting of walls in color selected by Owner.
    - d. Construction and installation of dressing counter with lighted mirrors.
    - e. HVAC modifications to existing system.
    - f. Plumbing modifications and installation of new plumbing fixtures.
    - g. Fire protection sprinkler modifications.
    - h. Re-work electrical systems and install additional receptacles.
    - i. Installation of new ceiling lighting and lighting for dressing mirrors
    - j. Modifications to existing fire alarm system including graphic updates for fire alarm network.
  - B. Procedures
    - 1. Coordination: Modify or adjust affected adjacent work as necessary to completely integrate work of the Base Bid into the Project.
    - 2. Include as part of the Base Bid miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of the Base Bid.

1.04 SCOPE OF WORK – ALTERNATES

- A. The following, but not limited to, is included in the Alternate(s)
  - 1. Alternate No. 1: New Lockers
    - a. Purchase and installation of new lockers
- B. The cost or credit for each Alternate is the net addition to or deduction from the Contract Sum to incorporate Alternate into the Work. No other adjustments are made to the Contract Sum.
- C. Procedures
  - 1. Coordination: Modify or adjust affected adjacent work as necessary to completely integrate work of the Alternate into the Project.
  - 2. Include as part of each Alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of Alternate.
  - 3. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each Alternate. Indicate if Alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated modifications to Alternates.

01 10 00  
SUMMARY OF WORK

- 4. Execute accepted Alternates under the same conditions as other work of the Contract.
  - D. Selection and Award of Alternates: The Owner reserves the right to selectively accept or reject Alternates at their discretion and is under no obligation to accept any Alternates.
- 1.05 BID SUBMISSION REQUIREMENTS
- A. Bids shall be submitted on the included Bid Form (Section 00 20 00) and will be reviewed and accepted or rejected at the Owner's option.
  - B. All Bids shall be held for a period of One Hundred Twenty (120) Calendar days after submission of the Bid.
- 1.06 RELATED WORK SPECIFIED ELSEWHERE
- A. The Prime Contractor shall be aware, and shall make his subcontractors aware that the requirements in the sections of Divisions 00 and 01 pertain to all the work and they are binding on each section of these specifications as if they were repeated in each section in their entirety.
  - B. The Prime Contractor shall be responsible for understanding the scope and intent of the work in all sections of these Specifications
  - C. The Prime Contractor is responsible for review of all sections of the Specifications and all Drawings to confirm any additional areas of responsibility.
  - D. All Contractors are responsible for their area of work which might show up only on a drawing from another series or Specification section.
- 1.07 CONTRACTS
- A. Work shall be performed under one Prime Contract.
- 1.08 PRIME CONTRACTOR'S DUTIES
- A. Project Supervision: see Section 00 20 20 item 1.09 for requirements
  - B. Except as specifically noted, provide and pay for:
    - 1. Labor, materials and equipment
    - 2. Tools, construction equipment and machinery
    - 3. Other facilities and services necessary for proper execution and completion of work
  - C. Pay legally required State and Federal Taxes.
  - D. Contractor shall make all his own measurements in the field and shall be responsible for correct fitting. He shall coordinate this work with all other branches in such a manner as to cause a minimum of conflict or delay. Contractor shall coordinate his work in advance with all other trades and report immediately any difficulty which can be anticipated.
  - E. The Contract Documents shall be carefully studied by the Contractor during the course of construction. Any errors in layout or errors of omission which are discovered shall be referred immediately to the Architect/Engineer for interpretation or correction.
  - F. Secure and pay for, as necessary for proper execution and completion of work, and as applicable at time of receipt of bids:
    - 1. Permits
    - 2. Licenses
  - G. Give required notices.
  - H. Comply with codes ordinances, rules, regulations, orders and other legal requirements of public authorities which bear on performance of work.
  - I. Promptly submit written notice to Architect/Engineer of observed variances of Contract Documents from legal requirements.



01 10 00  
SUMMARY OF WORK

- J. Enforce strict discipline and good order among employees.
- K. Coordinate delivery and installation dates with Architect/Engineer and Owner and incorporate into Construction Schedule.
- L. Prepare and update Construction Schedule.
- M. Notify and receive approval from the Owner at least 48 hours in advance for utility connections, or shut-off. Coordinate these operations with the Owner, through the Architect/Engineer, and complete the work in the minimum amount of time.
- N. Notify the Architect/Engineer in writing when work is completed and keep the Architect/Engineer informed of the progress of the work. No work shall be closed or covered until it has been inspected and approved. Should work not inspected be covered, uncover all such work so that it can be properly inspected and after such inspection, properly repair and replace all of the work at no additional cost to the Owner.
- O. Where the Contract Documents require any work to be tested, the Architect/Engineer shall be notified sufficiently in advance so that he may observe such tests.
- P. Contractor shall submit a copy of any permits he has secured before starting work on this project unless otherwise stated by Owner.
- Q. Where the Contract Documents require the use of AIA Documents including, but not limited to, G702 Application and Certificate for Payment and G703 Continuation Sheet.
- R. For Projects in excess of \$150,000.00 submit with each Application for Payment the Owner's Mandatory Tier II Spend Report using the ISU Business Diversity Spend Reporting Form for Construction/Renovation/Facilities Repair Projects per instructions on the Section 00 10 41 Tier II Spending Reporting Form.

1.09 OTHER REQUIREMENTS

- A. Nightly the Prime Contractor shall secure the construction site to discourage unauthorized individuals from accessing the site. Special effort to secure the site shall be made on Friday evenings.
- B. While the site shall be kept orderly at all times, weekly the Prime Contractor shall clean-up the construction site of:
  - 1. Any accumulated trash and rubbish.
  - 2. Dirt, dust, mud, etc. associated with the construction process.
  - 3. Salvaged materials not slated for re-use and excess materials not slated for use.

PART 2 – NOT USED

PART 3 – NOT USED

END OF SECTION 01 10 00

01 10 00  
SUMMARY OF WORK

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01 23 60  
ALLOWANCES

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. This Section includes administrative and procedural requirements governing allowances.
  - 1. Certain materials and equipment are specified in the Contract Documents by allowances. In some cases, these allowances include installation. Allowances have been established in lieu of additional requirements and to defer selection of actual materials and equipment to a later date when additional information is available for evaluation. If necessary, additional requirements will be issued by Change Order.
- B. Types of allowances include the following:
  - 1. Lump-sum allowances.
  - 2. Unit-cost allowances.
  - 3. Contingency allowances.
  - 4. Testing and inspecting allowances.
  - 5. Quantity allowances.
- C. Related Sections include the following:
  - 1. Division 01 Section "Contract Modification Procedures" for procedures for submitting and handling Change Orders.
  - 2. Division 01 Section "Quality Requirements" for procedures governing the use of allowances for testing and inspecting.

1.03 SELECTION AND PURCHASE

- A. At the earliest practical date after award of the Contract, advise the Architect of the date when final selection and purchase of each product or system described by an allowance must be completed to avoid delaying the Work.
- B. At Architect's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.
- C. Purchase products and systems selected by Architect from the designated supplier.

1.04 SUBMITTALS

- A. Submit proposals for purchase of products or systems included in allowances, in the form specified for Change Orders.
- B. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.

1.05 CONTINGENCY ALLOWANCES

- A. Use the contingency allowance only as directed by Architect for Owner's purposes and only by Change Orders that indicate amounts to be charged to the allowance.
- B. Contractor's overhead, profit, and related costs for products and equipment ordered by Owner under the contingency allowance are included in the allowance and are not part of the Contract Sum. These costs include delivery, installation, taxes, insurance, equipment rental, and similar costs.
- C. Change Orders authorizing use of funds from the contingency allowance will include Contractor's related costs and reasonable overhead and profit margins.

01 23 60  
ALLOWANCES

- D. At Project closeout, credit unused amounts remaining in the contingency allowance to Owner by Change Order.

1.06 TESTING AND INSPECTING ALLOWANCES

- A. Testing and inspecting allowances include the cost of engaging testing agencies, actual tests and inspections, and reporting results.
- B. The allowance does not include incidental labor required to assist the testing agency or costs for retesting if previous tests and inspections result in failure.
- C. Costs of services not required by the Contract Documents are not included in the allowance.
- D. At Project closeout, credit unused amounts remaining in the testing and inspecting allowance to Owner by Change Order.

1.07 UNUSED MATERIALS

- A. Return unused materials purchased under an allowance to manufacturer or supplier for credit to Owner, after installation has been completed and accepted.
  - 1. If requested by Architect, prepare unused material for storage by Owner when it is not economically practical to return the material for credit. If directed by Architect, deliver unused material to Owner's storage space. Otherwise, disposal of unused material is Contractor's responsibility.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Examine products covered by an allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.

3.02 PREPARATION

- A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

3.03 SCHEDULE OF ALLOWANCES

- A. Allowance # 1: A \$10,000.00 Allowance shall be included in the Base Bid for Unforeseen Conditions and General Construction Contingency. It is solely at the discretion of the Architect/Engineer/Owner what costs may be applied to this Allowance. Any unused Allowance monies shall be returned to the Owner at Project closeout by Change Order.

END OF SECTION 01 23 60

01 25 00  
CONTRACT CONSIDERATIONS

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Schedule of Values
- B. Application for Payment
- C. Change procedures
- D. Alternates
- E. Substantial Completion
- F. Final Completion

1.02 SCHEDULE OF VALUES

- A. Submit a printed schedule on AIA Form G703 - Application and Certificate for Payment Continuation Sheet or similar form.
- B. Submit Schedule of Values electronically in PDF format within 15 calendar days after date of the Award Letter.
- C. Format: Utilize the Table of Contents of this Project Manual. Identify each line item with number and title of the major specification Section. Identify site mobilization, bonds and insurance, and other overhead costs.
- D. Include in each line item, the amount of Allowances specified in this section. For unit cost Allowances, identify quantities taken from Contract Documents multiplied by the unit cost to achieve the total for the item.
- E. Include within each line item, a direct proportional amount of Contractor's overhead and profit.
- F. Revise schedule if additional Alternates are Awarded after the initial Award by adding these Alternates as separate line items broken down in detail as was provided in the initial approved Schedule of Values.
- G. Revise schedule to list approved Change Orders, broken down in detail as was provided in the initial approved Schedule of Values.
- H. Submit "Consent of Surety to Schedule of Values" with Schedule of Values.

1.03 APPLICATIONS FOR PAYMENT

- A. Submit four (4) copies of each application on AIA Form G702- Application and Certificate for Payment and AIA G703 - Continuation Sheet or similar.
- B. Content and Format: Utilize most current approved Schedule of Values for listing items in each Application for Payment.
- C. Payment Period: As indicated in the Contract Documents.
- D. Waiver of Liens.
- E. Include Certified Payroll forms if required by Owner.

1.04 CHANGE PROCEDURES

- A. The Architect/Engineer will advise of minor changes in the Work not involving and adjustment to Contract Sum/Price or Contract Time as authorized by AIA A201, 2007 Edition, Paragraph 7.4 by issuing supplemental instructions on AIA Form G710 or ISU Form SI/FCC-12.
  - 1. The Architect/Engineer may issue a Request for Proposal (RFP) which includes A detailed description of a proposed change, with supplementary or revised Drawings and

01 25 00  
CONTRACT CONSIDERATIONS

Specifications if required. Contractor shall prepare and submit an estimate within 10 calendar days, listing if:

- a. A change in Contract Time for executing the change is requested.
  - b. A stipulation of any overtime work required
  - c. The period of time during which the requested price will be considered valid, but not less than 21 calendar days.
- B. The Contractor may propose changes by submitting a request for change, Change Proposal (CP), to the Architect/Engineer, describing the proposed change and its full effect on the Work.
1. Include a statement describing:
    - a. The reason for the change.
    - b. The effect on the Contract Sum/Price and Contract Time with full documentation.
    - c. A statement describing the effect on Work by separate or other Contractors.
    - d. A stipulation of any overtime work required.
    - e. The period of time during which the requested price will be considered valid, but not less than 21 calendar days.
- C. RFP and CP Pricing
1. Project Supervision costs:
    - a. Section 00 20 20 Item 1.09 states in part:

“The Prime Contractor shall maintain on the Project site a competent Project Superintendent at all times any work is being performed; either by the Prime Contractor’s workers or any Subcontractor’s workers.”
    - b. There shall be no costs included in the pricing of a RFP or CP for Project Superintendent’s Supervision Hours while the work is being performed unless the Work included in the RFP/CP pricing will occur at a time not within the normal scheduled Project hours of construction.
  2. Contractor Mark-up and Allowable Charges
    - a. Section 00 20 11 2.07 Subparagraph 3.3.3.7, 3.3.3.8 and 3.3.3.9 states:

“.7 Extra Work shall be performed for the cost of the labor payroll plus 15% of the labor payroll and the cost of the material plus 5% of the material cost. Said markup fees are intended to compensate for the cost of payroll taxes, insurance of all kinds, all taxes of the Contractor, including State Taxes, Federal Income Tax, Unemployment, and FICA Taxes, as well as all other overhead costs, expenses, and carrying charges whatsoever, including the profit to be derived from such additional Work. Labor payroll is defined as the actual hourly labor cost plus any fringes payable as listed on the wage rate schedule(s) provided as required by the Bidding Documents.

.8 In case such Work is performed by a Subcontractor or a lower tier Contractor with the Owner’s consent, the Work shall be marked up as indicated in 7.3.3.7 by the Contractor actually performing the Work. Each succeeding Contractor may mark up their direct labor and material costs as indicated in 7.3.3.7. Otherwise each succeeding Contractor, including the Prime Contractor, may add 5% for handling/coordination. Additional mark-ups of a Subcontractor’s costs shall not be permitted.

CONTRACT CONSIDERATIONS

“9 Costs for bond premiums are allowable provided documentation from the Bonding Company is included detailing the added bond cost premium, the current bond total and the new bond total.”

- b. Labor charges subject to the 15% mark-up shall be based on the actual labor payroll defined as the actual hourly labor cost plus any fringes payable as listed on the wage rate schedule(s) provided as required by the Bidding Documents.”. The Wage Rate Schedule, submitted as required by the Contract Documents, shall be used to determine if the hourly labor rate used for pricing and labor mark-up is correct.
  - c. Insurance, Taxes and similar shall not be included in the RFP or CP pricing since, per 3.3.3.7, “Said markup fees are intended to compensate for the cost of payroll taxes, insurance of all kinds, all taxes of the Contractor, including State Taxes, Federal Income Tax, Unemployment, and FICA Taxes, as well as all other overhead costs, expenses, and carrying charges whatsoever, including the profit to be derived from such additional Work”.
3. All RFP and CP pricing shall be submitted in enough detail for the Architect/Engineer and Owner to properly evaluate the proposed pricing. These pricing details extend to the lower tier Subcontractor’s pricing as well. The Architect/Engineer and Owner may request additional pricing breakdown if in their opinion insufficient pricing detail was provided for evaluation. The Contractor shall promptly provide the additional pricing detail.
- D. Stipulated Sum/Price Change Order: Based on Proposal Request and Contractor's fixed price quotation or Contractor's request for a Change Order as approved by Architect/Engineer and Owner.
  - E. Construction Change Directive: Architect/Engineer may issue a directive, on AIA Form G713 or ISU Form CCD-18 Construction Change Directive signed by the Owner, instructing the Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order. Document will describe changes in the Work, and designate method of determining any change in Contract Sum/Price or Contract Time. Promptly execute the change.
  - F. Maintain detailed records of work done on Time and Material basis. Provide full information required for evaluation of proposed changes, and to substantiate costs for changes in the Work.
  - G. Execution of Change Orders: Architect/Engineer will issue Change Orders for signatures of parties as provided in the Conditions of the Contract.

## 1.05 ALTERNATES

- A. Alternate Bid prices shall be held for one hundred twenty (120) days from date of Bid.
- B. Alternate Bids may be used as the basis for Award of Contract.
- C. The Owner may Award none, some or all Alternates submitted.
- D. The Owner is under no obligation to accept any Alternates submitted.
- E. Accepted Alternates shall be listed as separate line items on the Schedule of Values broken down as directed by the Architect/Engineer/Owner.

## 1.06 SUBSTANTIAL COMPLETION

- A. The substantial completion date shall be as listed in Section 001010 INSTRUCTIONS TO BIDDERS. The substantial completion date may be adjusted as allowed by the Contract Documents or as mutually agreed upon in writing by the Owner and Contractor.
- B. **Should a Contractor list an early substantial completion date on their Project Schedule or any Project Document, this early substantial completion date shall not be permitted to be used as a claim for additional compensation for the Contractor’s failure to meet their early substantial completion date.**

CONTRACT CONSIDERATIONS

- C. Warranty: The Warranty Period shall commence at substantial completion per AIA A201-2007 Article 3 Paragraph 3.5 as amended by Specification Section 00 20 11 AMENDMENTS TO GENERAL CONDITIONS.

1.07 FINAL COMPLETION

- A. The Contractor's final Application for Payment (Release of Retainage) shall not be approved for payment until all punch list items are complete, all claims (Contractor and Subcontractor) have been resolved and all conditions of Section 01 77 00 PROJECT CLOSEOUT have been met.
- B. Requests for compensation, for previously approved Change Orders omitted from an Application for Payment, received sixty (60) calendar days after receipt of the Final Application for Payment (Release of Retainage) shall not be honored.**
- C. Final payment will be due and payable the late of sixty-one (61) days from date of receipt of the Final Application for Payment or after the Contractor has completed all punch list items, certified that all Subcontractors and Suppliers have been paid, and all claims, including the Contractor's, have been resolved. Before issuance of the final payment, the Contractor shall furnish an affidavit (Final Waiver of Lien) as evidence that there are no claims on account of the Contract, outstanding liens of claims for materials furnished, or labor performed on the work. The final payment shall constitute the acceptance of the work by the Owner, except as to work thereafter found to be defective. The date of such payment shall be regarded as the date of final acceptance of the work.

PART 2 – NOT USED

PART 3 – NOT USED

END OF SECTION 01 25 00



01 31 00  
COORDINATION AND MEETINGS

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Coordination.
- B. Field engineering.
- C. Preconstruction meeting.
- D. Progress meetings.
- E. Field Record Drawings and Specifications

1.02 COORDINATION

- A. Coordination scheduling, submittals, and Work of the various sections of the Project Manual to assure efficient and orderly sequence of installation of interdependent construction elements, with provision for accommodating items installed later.
- B. Verify utility requirements and characteristics of operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
- C. Coordinate space requirements and installation of mechanical and electrical work which are indicated diagrammatically on drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with line of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
- D. The Contractor shall provide coordination drawings for above-ceiling areas where at least two different services run in parallel or cross one another. Drawings are to be submitted, reviewed by the consultant team, and returned to the contractor prior to the start of any installation in these areas.
- E. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.
- F. Coordinate completion and cleanup of Work of separate sections in preparation for Substantial Completion and for portions of Work designated for Owner's occupancy.
- G. After Owner occupancy of premises, coordinate access to site for correction of defective Work and Work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

1.03 FIELD ENGINEERING

- A. Contractor to locate and protect survey control and reference points.
- B. Control datum for survey is that established by Owner provided survey and/or shown on Drawings.
- C. Verify set-backs and easements, confirm drawing dimensions and elevations.
- D. Provide field engineering services. Establish elevations, lines, and levels, utilizing recognized engineering survey practices.
- E. Submit a copy of registered site drawing and certificate signed by the Land Surveyor that the elevations and locations of the Work is in conformance with the Contract Documents.

1.04 PRECONSTRUCTION MEETING

- A. Architect/Engineer will schedule a meeting after Notice of Award.
- B. Attendance Required: Owner, Architect/Engineer, Contractor and major subcontractors.

01 31 00  
COORDINATION AND MEETINGS

C. Agenda:

1. Introductions.
  - a. Official Project Name and Number (to appear on all Project correspondence)
  - b. Designation of personnel representing the parties in Contract, Owner and the Architect/Engineer
2. Status of required paperwork to ISU Purchasing Department.
3. Distribution of Contract Documents.
4. Submission of full list of sub-contractors and suppliers, schedule of values, proposed pay application schedule and proposed project schedule.
5. Procedures and processing of submittals, substitutions, field decisions, proposal request, Change Orders, and Contract closeout procedures.
6. Scheduling activities of a Testing Agency (if required).
7. Use of premise by Owner and Contractor.
8. Owner's requirements and partial occupancy.
9. Construction facilities and controls provided by Owner.
10. Temporary utilities.
11. Survey and building layout.
12. Security and housekeeping procedures.
13. Procedures for testing.
14. Procedures for maintaining record documents.

- D. Architect/Engineer to record minutes and distribute copies within seven (7) days after meeting to participants, with copies to Architect/Engineer, Owner, and those affected by decisions made.

1.05 PROGRESS MEETINGS

- A. Schedule and attend meetings throughout progress of the Work at maximum monthly intervals.
- B. Architect/Engineer will make arrangements for meetings, prepare agenda with copies for participant and preside at meetings.
- C. Attendance Required: Job superintendent, major Subcontractors and suppliers, Owner, and Architect/Engineer, as appropriate to agenda topics for each meeting.

D. Agenda:

1. Review minutes of previous meetings.
2. Review of Work progress.
3. Field observations, problems, and decisions.
4. Identification of problems which impede planned progress.
5. Review of submittals schedule and status of submittals.
6. Review of off-site fabrication and delivery schedules.
7. Maintenance of progress schedule.
8. Corrective measures to regain projected schedules.
9. Planned progress during succeeding work period.
10. Coordination of projected progress.
11. Maintenance of quality and work standards.
12. Effect of proposed changes on progress schedule
13. Other business relating to Work.

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COORDINATION AND MEETINGS

- E. Architect/Engineer to record minutes and distribute copies within seven (7) days after meeting to participants, with copies to the Owner, and those affected by decisions made.

1.06 FIELD PROJECT RECORD DOCUMENTS

A. Documents and Samples at the Site:

1. General: The Prime Contractor shall maintain at the site for the Owner and A/E a record copy of the Drawings, Specifications, addenda, bulletins, Architect/Engineer's Supplemental Instructions, and Change Orders, in good order and marked currently to record changes and selections made during construction, and in addition reviewed Shop Drawings, Product Data, Samples and similar required submittals. These shall be available to the Owner and the Architect/Engineer review.
2. Posting:
  - a. Record Drawings: Keep a complete record of the locations of all items indicating the Work as actually installed. Changes and deviations are to be indicated on the Record Contract Drawings. Give particular attention to concealed work which would be difficult to identify, measure, and record at a later date. The Subcontractor shall record concealed items, changes, and deviations under the direction of the Contractor as the Work progresses. The Contractor shall clearly identify all deviations from the Contract Documents.
  - b. Record Specifications: Indicate the changes made by addendum, bulletin, Architect/Engineer's Supplemental Instructions, and Change Order. Indicate the manufacturer selected for all items whether specified proprietarily or generally.
  - c. No review of record documents by the Architect/Engineer/Owner shall be a waiver of deviations from the Contract Documents or the submittals, or in any way relieve the Contractor from his responsibility to perform the Work in accordance with the Contract Documents.

PART 2 - NOT USED

PART 3 – NOT USED

END OF SECTION 01 31 00

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COORDINATION AND MEETINGS

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SUBMITTALS AND SUBSTITUTIONS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Wherever possible throughout the Contract Documents, the minimum acceptable quality of workmanship and materials has been defined either by manufacturer's name and catalog number or by reference to recognized industry standards.
- B. To ensure that the specified products are furnished and installed in accordance with the design intent, procedures have been established for advance submittal of design data and for its review by the Architect/Engineer.
- C. The Architect/Engineer's review of Contractor's material submittal shall not relieve the Contractor of responsibility for errors, omission, quantities, or capacities even though work is executed in accordance with the reviewed/approved submittal material.
- D. The checking of the Contractor's Material Submittal is a gratuitous assistance and the Architect/Engineer does not thereby assume responsibility or liability for errors or omissions. Where such errors or omissions are discovered later, they shall be made good by the Contractor, irrespective of any review/approval by the Architect/Engineer since Contractor's Proposal assumes a complete, operable, and acceptable installation.
- E. Work Included:
  - 1. Submit, to the Architect/Engineer, shop drawings, project data and samples required by Specification sections electronically in PDF format.
  - 2. Simultaneous to submitting to the Architect/Engineer, the Contractor shall submit to the Owner's designated contacts a copy of all submittals provided to the Architect/Engineer in PDF Format.
  - 3. All submittals shall be separated by CSI format and shall list the appropriate CSI 6-digit code on the PDF file name. Submittal packages which include items listed under different Specification sections shall be submitted as separate PDF Files. Multiple submittals at different times under the same Specification Section shall have file name extension added to indicate the number of the submittal, e.g. 26 51 00(1), 26 51 00(2), etc.
  - 4. Designate in construction schedule dates for submission and dates reviewed shop drawings, project data and samples will be needed for each product in order to maintain the progress of construction as scheduled. Also indicate critical delivery dates of all items.
  - 5. Any submittal that requires expedited review shall be noted on the submittal cover page with a "required by" review date listed. A Contractor's failure to submit in a timely manner is not cause to request an expedited review.

1.02 PRODUCT HANDLING

- A. Make all submittals of shop drawings, samples, requests for substitution, and other similar items, in strict accordance with the provisions of this section of these Specifications.

1.03 DEFINITIONS

- A. Shop Drawings:
  - 1. Original drawings, prepared by Contractor, subcontractor, supplier or distributor, which illustrate some portion of the work, showing fabrication, layout, setting or erection details.
    - a. Prepared by a qualified detailer
    - b. Identify details by reference to sheet and detail numbers shown on contract drawings.

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SUBMITTALS AND SUBSTITUTIONS

- B. Product Data:
1. Manufacturer's standard schematic drawings:
    - a. Scanned copies of schematic drawings from hard copy paper catalog pages are not acceptable. Obtain PDF files of schematic drawings from the Supplier/Manufacturer for submission.
    - b. Modify drawings to delete information which is not applicable to project.
    - c. Supplement standard information to provide additional information applicable to project.
  2. Manufacturer's catalog sheets, brochures, diagrams, schedules, performance charts, illustrations and other standard descriptive data.
    - a. Scanned copies of catalog sheets from hard copy paper catalog pages are not acceptable. Obtain PDF files of items from the Supplier/Manufacturer for submission.
    - b. Clearly mark each item to identify pertinent materials, products, or models to be provided.
    - c. Show dimensions and clearances required.
    - d. Show performance characteristics and capabilities.
    - e. Show wiring diagrams and controls.
  3. Material and Safety Data Sheets shall be furnished for all applicable Project Materials.

1.04 SUBMITTAL REVIEW TIME

- A. Every effort will be made to return submittals within ten (10) calendar days or less.
- B. This ten (10) days may require adjustment based on, but not limited to, the following:
  1. Complexity of the submittal
  2. Size of the job and number of items included in the submittal
  3. Number of submittals received at the same time or on the same day
- C. Submittals received that do not clearly indicate the items being provided on the submittal will be returned marked "Rejected Resubmit" which will further delay the submittal return time.

PART 2 - PRODUCTS

2.01 SHOP DRAWINGS

- A. Scale required: Unless otherwise specifically directed by the Architect/Engineer, make all shop drawings accurately to a scale sufficiently large to show all pertinent features of the item and its method of connection to the work.
- B. All shop drawings shall be submitted electronically in PDF Format to the Architect/Engineer with a simultaneous submission to the Owner's designated recipients.
- C. Accompany shop drawings with transmittal letter containing:
  1. Date and revision dates
  2. Project title and number
  3. The names of:
    - a. Architect/Engineer
    - b. Contractor
    - c. Subcontractor
    - d. Supplier
    - e. Manufacturer
    - f. Separate detailer when pertinent

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SUBMITTALS AND SUBSTITUTIONS

4. Identification of product or material
  5. Relation to adjacent structure or materials
  6. Field dimensions, clearly identified as such
  7. Specification section number
  8. Applicable standards, such as ASTM number of Federal Specification
  9. A blank space 2-1/2" x 3", for the Architect/Engineer's electronic stamp
- D. Identification of deviations from Contract Documents
- E. Contractor's stamp, initialed or signed, certifying to review of submittal, verification of field measurements and compliance with Contract Documents. Any materials submitted without the Contractor's stamp of approval will be returned to the Contractor with no action taken.
- F. Reviewed shop drawings shall be returned to the Contractor and Owner's designated recipients electronically stamped as follows:
1. Reviewed
  2. Reviewed as Noted
  3. Rejected - Resubmit
- G. The Owner shall submit their review comments to the Architect/Engineer. Official Review of shop drawings shall be by the Architect/Engineer only. The Contractor shall not proceed based on Owner comments only unless the Owner is the Architect/Engineer.

2.02 SUBMITTALS

- A. All submittals for materials and equipment shall be made within forty (40) days of award of the contract and in no case shall any materials or equipment be delivered to the job site until submittals have been reviewed by the Architect/Engineer and Owner. This requirement will be a condition for approval of subsequent Applications for Payment.
- B. All submittals shall be submitted electronically in PDF Format to the Architect/Engineer with a simultaneous submission to the Owner's designated recipients.
- C. Submittals which reflect color samples shall be submitted in color.
- D. Accompany submittals with transmittal letter containing:
1. Date and revision dates
  2. Project title and number
  3. The names of:
    - a. Architect/Engineer
    - b. Contractor
    - c. Subcontractor
    - d. Supplier
    - e. Manufacturer
    - f. Separate detailer when pertinent
  4. Identification of product or material
  5. Relation to adjacent structure or materials
  6. Field dimensions, clearly identified as such
  7. Specification section number
  8. Applicable standards, such as ASTM number of Federal Specification
  9. A blank space 2-1/2" x 3", for the Architect/Engineer's electronic stamp
- E. Identification of deviations from Contract Documents
- F. Contractor's stamp, initialed or signed, certifying to review of submittal, verification of field

01 32 00  
SUBMITTALS AND SUBSTITUTIONS

measurements and compliance with Contract Documents. Any materials submitted without the Contractor's stamp of approval will be returned to the Contractor with no action taken.

- G. Reviewed submittals shall be returned to the Contractor electronically stamped as follows:
  - 1. Reviewed
  - 2. Reviewed as Noted
  - 3. Rejected - Resubmit
- H. The Owner shall submit their review comments to the Architect/Engineer. Official Review of submittals shall be by the Architect/Engineer only. The Contractor shall not proceed based on Owner comments only unless the Owner is the Architect/Engineer.

2.03 SAMPLES

- A. Physical samples as defined by the General Conditions shall be furnished to the Architect/Engineer for approval prior to ordering or fabrication of any product.
- B. Submit samples as specified in each of specification sections.
- C. Submit an electronic transmittal or review sheet stamped by the Contractor with a blank space for the Architect/Engineer's electronic stamp.

2.04 SUBSTITUTIONS DURING CONSTRUCTION

- A. The approved "Suppliers and Manufacturers List" is an essential part of the Contract. Substitutions of materials, equipment, etc. require the written approval of the Architect/Engineer and Owner. Substitutions during construction will only be considered when there is a proven benefit to the Owner. It is at the sole discretion of the Architect/Engineer and Owner to determine if the substitution is warranted.
  - 1. The Architect/Engineer and Owner will consider proposals for substitution of specified materials, equipment, and methods only when such proposals are accompanied by full and complete technical data and all other information required by the Architect/Engineer and Owner to evaluate the proposed substitution. Also, submit with request accurate cost data on the proposed substitution in comparison with the product specified, whether or not modification of the Contract Sum is to be a consideration.
  - 2. Do not substitute materials, equipment, or methods unless such substitution has been specifically approved for this work by the Architect/Engineer and Owner.
  - 3. Requests for substitution, when forwarded by the Contractor to the Architect/Engineer and Owner, are understood to mean that the Contractor:
    - a. Represents that they have personally investigated the proposed substitute product and determined that it is equal or superior in all respects to that specified;
    - b. Will provide the same guarantee for the substitution that they would for that specified;
    - c. Certifies that the cost data presented is complete and includes all related costs under this Contract, but excludes costs under separate contracts and the Architect's redesign cost, and that he waives all claims for additional cost related to the substitution which subsequently become apparent;
    - d. Will coordinate the installation of the accepted substitute, making such changes as may be required for the work to be complete in all respects.
- B. See Section 00 10 10 INSTRUCTIONS TO BIDDERS Item 1.08 for requirements for substitutions prior to Bid.

PART 3 – NOT USED

END OF SECTION 01 32 00



01 40 00  
QUALITY CONTROL

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Quality assurance - control of installation.
- B. Tolerances
- C. References.
- D. Mockup.
- E. Inspecting and testing laboratory services.
- F. Manufacturer's field services and reports.

1.02 QUALITY ASSURANCE - CONTROL OF INSTALLATION

- A. Monitor quality control over suppliers, manufacturers, Products, services, site conditions, and workmanship, to produce Work of specified quality.
- B. Comply with manufacturer's instructions, including each step in sequence.
- C. Should manufacturer's instructions conflict with Contract Documents, request clarification from Architect/Engineer before proceeding.
- D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. Perform work by persons qualified to produce workmanship of quality.
- F. Secure Products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.

1.03 TOLERANCES

- A. Monitor tolerance control of installed Products to produce acceptable Work. Do not permit tolerances to accumulate.
- B. Comply with manufacturer's tolerances. Should manufacturer's tolerances conflict with Contract Documents, request clarification from Architect/Engineer before proceeding.
- C. Adjust Products to appropriate dimensions; position before securing Products in place.

1.04 REFERENCES

- A. For Products or workmanship specified by association, trade, or other consensus standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
- B. Conform to reference standard by date of issue current on date of Contract Documents, except where a specific date is established by code.
- C. Obtain copies of standards where required by product specification sections.
- D. The contractual relationship, duties, and responsibilities of the parties in Contract nor those of the Architect/Engineer shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.05 INSPECTING AND TESTING LABORATORY SERVICES

- A. See Section 01 41 00 for requirements for the selection of Inspection and Testing Laboratory Services Testing Agency (Agencies) and responsibility for payment for these services.
- B. An independent firm will perform inspections, tests, and other services specified in individual specification sections and as required by the Architect/Engineer or the Owner.

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QUALITY CONTROL

- C. Inspecting, testing, and source quality control may occur on or off the project site. Perform off-site inspecting or testing as required by the Architect/Engineer or the Owner.
- D. Reports will be submitted by the independent firm to the Architect/Engineer and Contractor, in duplicate, indicating observations and results of tests and indicating compliance or non-compliance with Contract Documents.
- E. Cooperate with independent firm; furnish samples of materials, design mix, equipment, tools, storage, safe access, and assistance by incidental labor as requested.
- F. Notify Architect/Engineer and independent firm 24 hours prior to expected time for operations requiring services.
- G. Make arrangements with independent firm and pay for additional samples and tests required for Contractor's use.
- H. Testing or inspecting does not relieve Contractor to perform Work to contract requirements.
- I. Retesting required because of non-conformance to specified requirements shall be performed by the same independent firm on instructions by the Architect/Engineer. Payment for retesting will be paid by the Contractor.

1.06 MANUFACTURERS' FIELD SERVICES AND REPORTS

- A. When specified individual specification sections, require material or Product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust and balance of equipment as applicable, and to initiate instructions when necessary.
- B. Submit qualifications of observations. Observer subject to approval of Architect/Engineer.
- C. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturer's written instructions.
- D. Submit report in duplicate within 30 days of observations to Architect/Engineer for information.

PART 2 – NOT USED

PART 3 – NOT USED

END OF SECTION 01 40 00

01 42 00  
DEFINITIONS AND STANDARDS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division 01 Specification sections, apply to work of this section.

1.02 DESCRIPTION OF REQUIREMENTS

- A. General: This section specifies procedural and administrative requirements for compliance with governing regulations and the codes and standards imposed upon the work. The requirements include the obtaining of permits, licenses, inspections, releases and similar documentation, as well as payments, statements and similar requirements associated with regulations, codes and standards.
- B. "Regulations" is defined to include laws, statutes, ordinances and lawful orders issued by governing authorities, as well as those rules, conventions and agreements within the construction industry which effectively control the performance of the work regardless of whether they are lawfully imposed by governing authority or not.
- C. Governing Regulations: Refer to General and Supplementary Conditions for requirement related to compliance with governing regulations.

1.03 DEFINITIONS

- A. General Explanation: A substantial amount of specification language consists of definitions for terms found in other Contract Documents, including drawings. (Drawings must be recognized as diagrammatic in nature and not completely descriptive of the requirements indicated thereon). Certain terms used in Contract Documents are defined in this article. Definitions and explanations contained in this section are not necessarily either complete or exclusive, but are general for the work to the extent that they are not stated more explicitly in another element of the Contract Documents.
- B. General Requirements: The provisions or requirements of Division 00 and Division 01 sections apply to entire work of Contract and, where so indicated, to other elements which are included in project.
- C. Indicated: The term "indicated" is a cross-reference to graphic representations, notes or schedules in the specifications, and to similar means of recording requirements in Contract Documents. Where terms such as "shown", "noted", "scheduled" and "specified" are used in lieu of "indicated", it is for purpose of helping reader locate cross-reference, and no limitation of location is intended except as specifically noted.
- D. Directed, Requested, Etc.: Where not otherwise explained, terms such as "directed", "requested", "authorized", "selected", "approved", "required", "accepted", and "permitted", mean "directed by Architect/Engineer", "requested by Architect/Engineer", and similar phrases. However, no such implied meaning will be interpreted to extend Architect's/Engineer's responsibility into the Contractor's area of construction supervision.
- E. Approve: Where used in conjunction with Architect's/Engineer's response to submittals, requests, applications, inquiries, reports and claims by Contractor, the meaning of term "approved" will be held to limitations of Architect's/Engineer's responsibilities and duties as specified in General and Supplementary Conditions. In no case will "approval" by Architect/Engineer be interpreted as a release of Contractor from responsibilities to fulfill requirements of Contract Documents.
- F. Project Site: The term "project site" is defined as the space available to the Contractor for performance of the work, wither exclusively or in conjunction with others performing other work as part of the project. The extent of the project site is shown on the drawings, and may or may not be identical with description of the land upon which project is to be built.

DEFINITIONS AND STANDARDS

- G. Furnish: Except as otherwise defined in greater detail, term "furnish" is used to mean supply and deliver to project site, ready for unloading, unpacking, assembly, installation, and similar operations, as applicable in each instance.
  - H. Install: Except as otherwise defined in greater detail, term "install" is used to describe operations at project site including unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning and similar operations, as applicable in each instance.
  - I. Provide: Except as otherwise defined in greater detail, term "provide" means to furnish and install, complete and ready for intended use, as applicable in each instance.
  - J. Installer: The term "installer" is defined as the entity (person or firm) engaged by the Contractor, its Subcontractor or Sub-subcontractor for performance of a particular unit of work at the project site, including installation, erection, application and similar required operations. It is a requirement that installers be expert in the operations they are engaged to perform.
  - K. Testing Laboratories: The term "testing laboratory" is defined as an independent entity engaged to perform specific inspections or tests of the work, either at the project site or elsewhere; and to report and, if required, interpret results of those inspections or tests.
- 1.04 PROJECT MANUAL FORMAT AND CONTENT EXPLANATION
- A. General: This article is provided to help the user of these specifications more readily understand the format, language, implied requirements and similar conventions of content. None of the following explanations shall be interpreted to modify the substance of the contract requirements.
  - B. Production Methods: Portions of these specifications have been produced by the Architect's/Engineer's standard method of editing master specifications, and may contain minor deviations from traditional writing formats. Such deviations are a natural result of this production technique, and no other meaning shall be implied.
  - C. Project Manual Format: These specifications are organized based upon the Construction Specifications Institute's 33 Division format. The organization of these specifications into Divisions, Sections or Trade Headings generally conforms to recognized industry practice.
    - 1. Divisions are groupings of related or similar sections. The divisions are recognized as the construction industry consensus method of uniform specification organization.
    - 2. Sections: For convenience, "Sections" are considered as the basic units of work. The section title is descriptive only and not intended to limit the meaning or content of a section or to be completely descriptive of requirements specified therein.
    - 3. Section Numbering is used to facilitate cross-references in the Contract Documents. Sections are placed in the Project Manual in numeric sequence; however, the numeric sequence is not complete and the listing of the section in the "Index" at the beginning of the Project Manual must be consulted to determine the numbers and names of specifications sections in the Contract Documents.
  - D. Project Identification: The project number of the Contract Documents is the Bid Number recorded on the Project Manual Cover Sheet, in Section 00 10 00 Notice to Bidders and Section 00 20 00 Bid Form.
  - E. Page Numbering: Pages are numbered independently for each section. The section number is shown together with the page number at the bottom of each page to facilitate the location of text in the Project Manual.

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DEFINITIONS AND STANDARDS

- F. Text Subordination: Portions of specification text are subordinated to other portions in the following manner:
1. Certain sections may be subordinate to other sections or parts of other sections. When that occurs, the degree of subordination is described in those sections.
  2. Sub-articles, which are printed in upper/lower case lettering, are subordinate to Article titles.
  3. Paragraphs and lines of text are subordinate to sub-article titles.
  4. Paragraphs and lines of text that are indented from the left margin are subordinate to the preceding text that is either not indented, or is indented by a lesser amount.
- G. Project Manual Content: This project specification has been produced employing certain conventions in the use of language as well as conventions regarding the intended meaning of certain terms, words, and phrases when used in particular situations or circumstances. These conventions are explained as follows:
1. In certain circumstances, the language of the specifications and other Contract Documents is of the abbreviated type. It implies words and meanings that will be appropriately interpreted. Singular words will be interpreted as plural and plural words will be interpreted as singular where applicable and where the full context of the Contract Documents so indicates.
  2. Imperative language is generally used in specifications. Except as otherwise indicated, requirements expressed imperatively are to be performed by Contractor. At certain locations in the text, for clarity of reading, contrasting subjective language is used to describe responsibilities which must be fulfilled indirectly by Contractor or, when so noted, by others.
- H. Methods of Specifying: The techniques or methods of specifying requirements varies throughout the text.
1. The method used for specifying one unit or work has no bearing on requirements for another unit of work.
  2. Methods of specifying may include the following, or any combination of the following:
    - a. Prescriptive.
    - b. Open-generic-descriptive.
    - c. Performance.
    - d. Proprietary.
    - e. Compliance with reference standards.
- I. Specialists Assignments: In certain instances, specification text requires or implies that specific elements of the work are to be assigned to specialists or expert entities, who must be engaged for the performance of the work. Such assignments are intended to establish which part or entity involved in a specific element of the work is considered as being sufficiently experienced in the indicated construction processes or operations to be recognized as "expert" in those processes or operations. Nevertheless, the final responsibility for fulfillment of the entire set of all contract requirements remains with the Contractor.
- J. These requirements should not be interpreted to conflict with the enforcement of building codes and similar regulations governing the work. They are also not intended to interfere with local trade union jurisdictional settlements and similar conventions.
- K. Trades: Except as otherwise indicated, the use of titles such as "Carpentry" in specification text, is not intended to imply that the work must be performed by an accredited or unionized tradesperson of corresponding generic name (such as "carpenter"). It is also not intended to

DEFINITIONS AND STANDARDS

imply that specified requirements apply exclusively to work by tradespersons of that corresponding generic name.

## 1.05 DRAWING SYMBOL

- A. General: Except as otherwise noted indicated, graphic symbols used on drawings are those symbols recognized in the construction industry for purposes indicated. Where not otherwise noted, symbols are defined by "Architectural Graphic Standards", published by John Wiley & Sons, Inc., latest edition.
- B. Mechanical/Electrical Drawings: Graphic symbols used on mechanical/electrical drawings are generally aligned with symbols recommend by ASHRAE. Where appropriate, these symbols supplemented by more specific symbols as recommended by other recognized technical associations including ASME, ASPE, IEEE and similar organizations. Refer instances of uncertainty to the Architect/Engineer for clarification before proceeding.

## 1.06 INDUSTRY STANDARDS

- A. General Applicability of Standards: Except to the extent that more explicit or more stringent requirements are written into the Contract Documents, applicable standards of the construction industry have the same force and effect as if copied directly into the Contract Documents. Such industry standards are hereby made a part of the Contract Documents by reference. Individual specification sections indicate which codes and standards the Contractor must keep available for reference at the project site.
- B. Referenced standards (standard referenced directly in Contract Documents) have precedence over non-referenced standards which are recognized in industry for applicability to work.
- C. Non-referenced standards are hereby defined as not being applicable to the work, except as general requirement of whether the work complies with recognized construction industry standards.
- D. Publication Dates: Except as otherwise indicated, where compliance with an industry standard is required, comply with standard in effect as of date of Contract Documents.
- E. Updated Standards: At the request of the Architect/Engineer, Contractor or governing authority, submit a change order proposal where an applicable industry code or standard has been revised and reissued after the date of the Contract Documents and before the performance of the work affected. The Architect/Engineer will decide whether to issue the change order to proceed with the updated standard.
- F. Conflicting Requirements: Where compliance with 2 or more standards is specified, and where these standards establish different or conflicting requirements for minimum quantities or quality levels, the most stringent requirement will be enforced, unless the Contract Documents specifically indicate a less stringent requirement. Refer requirements that are different, but apparently equal, and uncertainties as to which quality level is more stringent to the Architect/Engineer for a decision before proceeding.
- G. Minimum Quantities or Quality Levels: In every instance, the quantity or quality level shown or specified is intended to be the minimum for the work to be provided or performed. Unless otherwise indicated, the actual work may either comply exactly, within specified, or may exceed that minimum within reasonable limits. In complying with these requirements, the indicated numeric values are either minimum or maximum values, as noted, or as appropriate for the context of the requirements. Refer instances of uncertainty to the Architect/Engineer for decision before proceeding.
- H. Copies of Standards: Contract Documents require that each entity performing work be experienced in that part of the work being performed. Each entity is also required to be familiar with recognized industry standards applicable to that part of the work. Copies of applicable standards are not bound with the Contract Documents.

DEFINITIONS AND STANDARDS

- I. Where copies of standards are needed for proper performance of the work, the Contractor is required to obtain such copies directly from the publication source.
- J. Although certain copies of standards needed for enforcement of the requirements may be required submittals, the Architect/Engineer reserves the right to require the Contractor to submit additional copies of these standards as necessary for enforcement of the requirements.
- K. Abbreviations and Names: Where acronyms or abbreviations are used in the specifications or other Contract Documents they are defined to mean the industry recognized name of the trade association, standards generating organization, governing authority or other entity applicable to the context of the text provision. Refer to the "Encyclopedia of Associations", published by Gale Research Co., available in most libraries.

## 1.07 GOVERNING REGULATIONS/AUTHORITIES

- A. General: The procedure followed by Architect/Engineer has been to contact governing authorities where necessary to obtain information needed for the purpose of preparing Contract Documents; recognized that such information may or may not be of significance in relation to Contractor's responsibilities for performing the work. Contact governing authorities directly for necessary information and decisions having a bearing on performance of work.
- B. Trade Union Jurisdictions: The Contractor shall maintain, and shall require Prime Subcontractor to maintain, complete current information on jurisdictional matters, regulations actions and pending actions, as applicable to the work. Discuss new developments at appropriate project meetings at the earliest feasible dates, and record information of relevance along with the actions agreed upon. The manner in which Contract Documents have been organized and subdivided is not intended to be an indication of jurisdictional or trade union agreements. Assign and subcontract the work, and employ trades-men laborers, in a manner which will not unduly risk jurisdictional disputes of kind which could result in conflicts, delays, claims and losses in the performance of the work.

## 1.08 SUBMITTALS

- A. Permits, Licenses, and Certificates: For the Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, and similar documents, correspondence and records established in conjunction with compliance with standards and regulations bearing upon performance of the work.

PART 2 – NOT USED

PART 3 – NOT USED

END OF SECTION 01 42 00

01 42 00  
DEFINITIONS AND STANDARDS

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01 50 10  
TEMPORARY FACILITIES - RENOVATION PROJECTS

PART 1 – GENERAL

1.01 CONTRACTOR'S USE OF PREMISES AND FACILITIES

- A. Confine operations at site to areas permitted by:
  - 1. Construction Limits
  - 2. Contract Documents
  - 3. Written Owner Approval
- B. Do not load structure with weight that will endanger structure or existing adjacent structures including any subsurface construction.
- C. The Prime Contractor shall assume full responsibility for protection and safekeeping of product stored on premises.
- D. The Prime Contractor shall move any stored products which interfere with operations of Owner or other Contractor.
- E. The activities of the Prime Contractor, including his subcontractors, material suppliers, employees, and others engaged in the work, shall be strictly limited to the Owner's property. Under no circumstances shall parking, material storage, or other uses of adjacent private property be permitted. Locations of storage areas, field office, parking areas, and the like on the project site shall be only within the construction limits as indicated on the drawings or as approved by the Owner.
- F. Use of Installed Work: Construction personnel may use toilet facilities, sink, and other fixtures and equipment installed in work only as expressly permitted by Architect/Engineer or Owner. Any privileges granted may be revoked if abused.
- G. Construction personnel shall exercise care and shall provide whatever protective measures are required to assure that their particular portions of the work do not damage or alter portions of the work that have been previously installed, either partially or completely. All work so damaged or altered shall be repaired or replaced to the satisfaction of the Architect by the party whose work has been affected, and the expense thereof shall be borne by the party who caused the damage or alteration.
- H. Protection of Floors: In interior areas used for construction or field "shops", protect floors from physical damage, oil drippings, and other staining which might impair bonding of new floor coverings, utilizing such methods as heavy polyethylene covering, sawdust or sand boxes, rigid insulation or the like.

1.02 FIELD OFFICE

- A. The Prime Contractor and their Sub-Contractors shall be responsible for their own field office.
- B. The Prime Contractor shall provide telephone service, including cellular phone for the on-site foreman, for the duration of the project.
- C. Provide at all times fire extinguishers as required by applicable codes and regulations.
- D. Post in a conspicuous space near the telephone, pertinent emergency phone numbers and notices as may be required by governing authorities and fire protection department.

1.03 SITE PROTECTION

- A. Contractor shall adhere to Factory Mutual Engineering and Research (FM) "Cutting and Welding" permit system. Permits are available through the Office of Environmental Safety's Fire Specialist Office at 812-237-4020.
- B. Prime Contractor shall provide a one hour fire watch at the end of each workday when any cutting or welding occurred to assure that no possibility of fire exists from any work performed that day.

TEMPORARY FACILITIES - RENOVATION PROJECTS

## 1.04 TEMPORARY ELECTRIC SERVICE

- A. Responsibility: The Prime Contractor shall be allowed to utilize the Owner's electricity for all construction purposes. The Prime Contractor shall arrange for the distribution and continuance throughout the work and the removal at the completion of the work of temporary electrical service. All electrical installations shall be by a Licensed Bonded Electrical Contractor. All elements of such temporary electric service shall conform to the regulations of the National Electric Code, current edition, and OSHA. All temporary wiring shall include a green equipment grounding conductor, and the entire temporary electrical service shall have equipment grounding continuity; all outlets for the connection of portable equipment shall be of the GFCI type. The Contractor shall provide all necessary wiring. The Prime Contractor or their Sub Contractor shall provide extension cords, outlets, etc. required to extend temporary service from nearest outlets of adequate capacity for the power required to points of usage.
- B. Distribution Wiring: The temporary distribution wiring shall be adequate to provide whatever is required for the operation of 120 volts, single-phase portable tools and equipment not exceeding one horsepower; the distribution wiring shall provide a receptacle within 50 feet of all portions of the building area.
- C. Temporary Lighting: The Prime Contractor shall provide all wiring, light bulbs and fixtures necessary to furnish temporary lighting of one watt per sq. ft. of construction area, but provide a minimum of one light in each enclosed space. Keep such temporary lighting in operation during all working periods.
- D. Supervision: The Prime Contractor shall maintain strict supervision over the use of the temporary electrical service and shall be responsible for damages incurred by misuse.

## 1.05 TEMPORARY WATER SERVICE

- A. The Prime Contractor may use the Owner's existing water service for construction purposes. The Prime Contractor shall provide and maintain leak-free, all hoses, fitting, nozzles, and the like required to distribute water to points of usage. Maintain strict supervision over use and waste of water. Take care not to spill or run water in any part of the building. Repair, replace, or restore (whichever may be deemed necessary by the Architect/Engineer) at no additional cost to the Owner, all work, new or existing, including equipment, furnishings, machines, finished surfaces, and the like which may be damaged by water due to construction operations, and by the misuse of such temporary water service. At completion of the work remove all temporary water distribution items.

## 1.06 RESTROOM FACILITIES

- A. The Contractor shall be permitted to utilize the Owner's restroom facilities in lieu of providing temporary toilets. The Contractor shall exercise reasonable care so as not cause excess soiling or damage to the restroom facilities.
- B. Any Contractor abuse of the Owner's restrooms shall be just cause for the Owner to revoke the use of the restrooms for the duration of the Project.

## 1.07 TEMPORARY STORAGE

- A. The Prime Contractor and each of their Sub-Contractors shall be responsible for their own temporary storage.
- B. Provide secure areas as may be required for storage and protection of materials, tools and equipment.

## 1.08 SIGNS

- A. Identification Signs: No signs or advertisements shall be permitted on the project site or on temporary structures, except those which are required to conform to the safety requirements of the Contract Documents or those which are expressly permitted by the Architect/Engineer or specified herein.

TEMPORARY FACILITIES - RENOVATION PROJECTS

## 1.09 TEMPORARY BARRIERS

- A. The Prime Contractor shall be responsible for seeing that all shafts and openings through the floors or roofs are adequately barricaded, marked, and lighted. They shall provide barriers, markers, or other provisions, or all, at all conditions, such as items protruding from the work, which might cause injury to persons. The design, locations, and requirements of protective barricades shall be subject to approval of the Architect/Engineer, but the Contractor shall be responsible for their adequacy. When such conditions no longer exist, barriers and the like shall be removed.

## 1.10 SITE SECURITY

- A. All temporary construction which may be required to maintain security of buildings or construction areas shall be provided by the Prime Contractor. At the end of each day's work, close all windows opened by construction personnel, and close all access doors to work areas. Work damaged in this regard shall be repaired or replaced to the satisfaction of the Architect/Engineer/Owner. Security guard service shall not be provided as a part of any Contract for this project for field office, storage sheds and storage areas, or for protection of construction tools, equipment, and materials. Such security may, at the Contractor's option, be provided at no additional cost to the Owner.

## 1.11 TRASH REMOVAL

- A. The Prime Contractor shall remove from the Construction site, and legally dispose of, all rubbish resulting from the work under his contract. Rubbish shall be removed daily and not be allowed to accumulate, other than the trash placed in trash containers outside the building.

## 1.12 RESTORATION OF TEMPORARY FACILITIES

- A. The Prime Contractor shall be responsible for his restoration of his own temporary facilities.
- B. Storage area and project offices: At completion of the work, remove from the project site all evidence of temporary services, field office, temporary sheds, covers, pallets, excess materials, scrap materials, equipment tools, waste, debris, and other foreign materials. Restore to the Architect/Engineer's satisfaction such area to its condition which existed prior to starting construction work, utilizing whatever methods are appropriate. Repair and patch to match all drive and parking lot surfaces damaged by construction processes; subject to the Architect/Engineer's approval. Fill, grade and reseed all lawn areas and replace all trees, plants or shrubs damaged by the construction process.

## 1.13 TEMPORARY CONSTRUCTION AREA ENCLOSURES/BARRIERS

- A. The Prime Contractor shall provide all temporary enclosures/barriers required to secure the construction area from the rest of the building.
- B. The enclosure/barrier shall be constructed in a manner to prevent unauthorized personnel from entering the construction area during non-hours of construction.
- C. The enclosure/barrier shall be constructed in a manner to limit the migration of construction dust and debris into adjacent non-construction areas.
- D. A lockable entrance assembly shall be installed in the designated point(s) of entry. The Prime Contractor shall supply their own locking mechanism for this entrance assembly. Furnish the Owner's representative(s) with a key for this locking mechanism for the duration of the Project.

PART 2 – NOT USED

PART 3 – NOT USED

END OF SECTION 01 50 10

01 50 10  
TEMPORARY FACILITIES - RENOVATION PROJECTS

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01 60 00  
MATERIALS AND EQUIPMENT

PART 1 – GENERAL

1.01 MATERIALS HANDLING

- A. Delivery: Deliver materials and equipment to Project Site in unopened, undamaged dry containers, wrappings, cartons, crates, sacks, or the like, clearly labeled as to product and materials, and with the manufacturer's name or trademark or both. Materials delivered in other than such condition may be rejected by the Architect/Engineer.
- B. Storage: Suitably store materials and equipment in designated areas and in accordance with manufacturer's recommendations or in a manner approved by the Architect or both. Store such materials and equipment off the ground, totally protected from ground splash, mud, weather separation, intrusion of foreign materials, and other damage. Do not store materials, equipment, or tools on roofs, unless such materials are to be immediately installed during the current work day, and unless equipment and tools are being integrally used in the work. Do not store volatile materials such as solvents, gasoline, oil, fuels, and the like within the building. Immediately remove paper, rags, etc., which might become soaked with such materials when they must be taken into the building for use in the work. At the end of each work day, remove such "safety cans" of materials to their storage area outside the building. The Contractor shall, upon delivery of material and equipment to the project site, check to ascertain that all materials, parts, accessories, and other incidentals necessary for the installation of such materials and equipment have been delivered and received at the project site, so that no delays are caused in the work due to insufficient quantities of materials or missing parts.

1.02 INSTALLATIONS

- A. Materials: Materials and equipment shall be new and undamaged and shall be installed as indicated on the drawings. They shall fit accurately into adjacent work and shall be plumb, level, and true-to-line. All materials and equipment shall be anchored securely and rigidly in place, maintaining alignment with adjacent work. Where installation methods and techniques are not specifically covered by the drawings or the specifications, normal first-class trade practices and manufacturer's instructions and recommendations shall govern, providing that they are approved by the Architect/Engineer.
- B. "Not-In-Contract" Items: Materials, equipment, fixtures, devices and other items indicated on the drawings as "Not-In-Contract" or "N.I.C." shall in no way be a part of the Contract. Where such "Not-In-Contract" items are accompanied by an indication to be installed by the Contractor, the Contractor shall receive, store, protect, assemble, install, and connect such items in accordance with the best accepted practices of the trade or trades involved and with the provisions of the Specifications for similar items that are totally part of the Contract. The Contractor shall be responsible for obtaining such specific information for the installation and connection of such items.
- C. Reinstalling Existing Items: Where existing materials, equipment, fixtures, devices, and other items are indicated on the drawings to be removed, or received, and reinstalled under the Contract, treat such existing items as if they were new and install such existing items as shown on the drawings, in accordance with the best accepted practices of the trade or trades involved and with provisions of the specifications for similar new items.

1.03 REMOVAL AND RE-INSTALLATION OF EQUIPMENT

- A. The Owner is not responsible for the removal or re-installation of equipment necessitated by this work.
- B. All electrical disconnects and reconnects of equipment necessitated by this work shall be performed by a licensed bonded Electrical Contractor hired by the Contractor to perform this work. The Owner will assist in locating the power source but will not be responsible for the

01 60 00  
MATERIALS AND EQUIPMENT

actual performance the electrical work.

1.04 ACCESSIBILITY

- A. The Contractor shall locate all equipment which must be serviced, operated or maintained in fully accessible positions. Minor deviations from the contract drawings may be made to allow for better accessibility, but changes of magnitude or which involve extra cost shall not be made without approval.
- B. It is the Contractor's responsibility to provide access panels when serviceable parts of his installation are concealed by finished construction, unless access panels are specifically indicated on the Drawings or elsewhere in the Project Manual to be by others. Access panel data shall be submitted with the equipment Shop Drawings.
- C. Ample space shall be allowed for removal of all parts that may require replacement or service in the future. The service area is to be indicated on Shop Drawings.
- D. The Contractor shall extend all grease fittings to an accessible location.

PART 2 – NOT USED

PART 3 – NOT USED

END OF SECTION 01 60 00

01 73 10  
CUTTING AND PATCHING

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Requirements and limitations for cutting and patching of Work

1.02 RELATED SECTIONS

- A. Section 01 10 00 - Summary of Work: Work by Owner or by separate contractors
- B. Section 01 32 00 - Submittals and Substitutions
- C. Section 01 60 00 - Materials and Equipment
- D. Individual Product Specification Sections:
  - 1. Cutting and patching incidental to work of the section
  - 2. Advance notification to other sections of openings required in work of those sections
  - 3. Limitations on cutting structural members

1.03 SUBMITTALS

- A. Submit written request in advance of cutting or alteration which affects:
  - 1. Structural integrity of any element of Project
  - 2. Integrity of weather exposed or moisture resistant element
  - 3. Efficiency, maintenance, or safety of any operational element
  - 4. Visual qualities of sight exposed elements
  - 5. Work of Owner or separate contractor
- B. Include in request:
  - 1. Identification of Project
  - 2. Location and description of affected Work
  - 3. Necessity for cutting or alteration
  - 4. Description of proposed Work and Products to be used
  - 5. Alternatives to cutting and patching
  - 6. Effect on work of Owner
  - 7. Date and time work will be executed

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Primary Products: Those required for original installation.

PART 3 – EXECUTION

3.01 RESPONSIBILITY

- A. Each respective Contractor is responsible for the required cutting and patching to complete his work.
- B. Each respective Contractor shall coordinate with the General Contractor and bear all costs associated with cutting and patching.

3.02 EXAMINATION

- A. Examine existing conditions prior to commencing Work, including elements subject to damage or movement during cutting and patching.

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CUTTING AND PATCHING

- B. After uncovering existing Work, assess conditions affecting performance of work.
- C. Beginning of cutting or patching means acceptance of existing conditions.

3.03 PREPARATION

- A. Provide temporary supports to ensure structural integrity of the Work. Provide devices and methods to protect other portions of Project from damage.
- B. Provide protection from elements for areas which may be exposed by uncovering work.
- C. Maintain excavations free of water.

3.04 CUTTING

- A. Execute cutting and fitting including excavation and fill to complete the Work.
- B. Uncover work to install improperly sequenced work.
- C. Remove and replace defective or non-conforming work.
- D. Remove samples of installed work for testing when requested.
- E. Provide openings in the Work for penetration of mechanical and electrical work.
- F. Employ original installer to perform cutting for weather exposed and moisture resistant elements, and sight-exposed surfaces.
- G. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.

3.05 PATCHING

- A. Execute patching to complement adjacent Work.
- B. Fit Products together to integrate with other Work.
- C. Execute work by methods to avoid damage to other Work, and which will provide appropriate surfaces to receive patching and finishing.
- D. Employ original installer to perform patching for weather exposed and moisture resistant elements, and sight-exposed surfaces.
- E. Restore work with new Products in accordance with requirements of Contract Documents.
- F. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- G. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material, to full thickness of the penetrated element.
- H. Refinish surfaces to match adjacent finish. For continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.

END OF SECTION 01 73 10



01 77 00  
CONTRACT CLOSEOUT

PART 1 – GENERAL

1.01 SUBSTANTIAL COMPLETION SUBMISSIONS

A. Record Drawings and Record Specifications:

1. The Contractor shall provide the final Field Record Drawings and Specifications which have been maintained and updated during the duration of the Project to the Architect/Engineer for review. Submit documents in paper form of each Drawing and Specification Division of the Work.
2. Certifications: The Prime Contractor and Subcontractors shall certify, by endorsement on the Record Drawings and Specifications that each of the revised sheets represents a complete and accurate record of the Work as executed.

B. Operations and Maintenance Data

1. Assemble a manual in electronic PDF format on USB Flash Drive indexed by Division of work Sub indexed by Specification of work, presenting for the Owner's guidance full details for care and maintenance of visible surfaces and of equipment included in the Work for review by the A/E.
  - a. Include a copy of the reviewed Architect/Engineer submittal and/or shop drawing. The Submittal and/or shop drawing shall be annotated by the Contractor indicating that the comments have been included in the document.
  - b. Include manufacturer's literature relating to motors and other equipment, catalog cut, parts lists, wiring diagrams, instruction sheets, and other pertinent information which will be useful to the Owner in overall operation and maintenance.
  - c. Include a list of installers and service representatives with company names and addresses, names of individuals to contact, and telephone numbers.
  - d. Include manuals called for in other Sections of the Specifications, in this manual.
2. Certifications: The Contractor shall certify, by endorsement of the manual, that the manual is complete and accurate.
3. On Projects where the Owner is the Architect/Engineer, submit to the Owner for review.

C. Warranties

1. Forms:
  - a. Extended Warranties: Provide a copy of the manufacturer's extended warranty, fill it out completely, sign it, and have it countersigned by the installer and manufacturer if required by the Contract Documents.
  - b. Manufacturers' Warranties: Manufacturer's warranty modified, when required to comply with requirements of the Contract Documents.
2. Starting Date: The starting date for warranties is the Date of Substantial Completion of the Work.
3. Submittal: At the time of Substantial Completion submit all warranties, including special warranties, required by the Contract Documents to the Architect/Engineer review.

D. Statement of Application

1. Submit Owner prepared fully executed Certificate of Substantial Completion.

E. Service and Maintenance Contracts

1. At the time of Substantial Completion submit executed contracts for extended service or maintenance required by the Contract Documents to the Architect/Engineer for review by the A/E.

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CONTRACT CLOSEOUT

2. Extended maintenance proposals where called for in the specification shall be submitted with the proposals for each trade at the time their portion of the work is bid. Furnish copies of the maintenance proposal to the Owner and Architect/Engineer for review prior to award of the subcontract for each portion of work.

1.02 FINAL CLEANING

- A. Responsibility: The Prime Contractor is responsible for the final cleaning of the Project and for the coordination and direction of cleaning by all trades.
- B. Materials:
  1. Use only cleaning materials recommended by the manufacturers of the surfaces to be cleaned.
  2. Use cleaning materials only on surfaces recommended by the cleaning materials manufacturers.
- C. Execution:
  1. Employ experienced workers, or professional cleaners, for final cleaning.
  2. Clean all surfaces whether exposed to view or not.
  3. Remove trash, rubbish, waste materials, tools, and equipment from the site.
  4. Remove grease, dust, dirt, plaster, mortar, fingerprints, and other foreign materials from interior and exterior surfaces exposed to view, e.g., the surfaces of structural steel, miscellaneous metal, woodwork, plaster, masonry, concrete, mechanical and electrical equipment, piping, duct work, and conduit; polish surfaces so designated to shine finish.
  5. Clean the electrical closets, pipe and duct shafts, chases, furred spaces, and similar spaces which are generally unfinished. Leave these spaces free from rubbish, loose plaster, mortar droppings, waste construction materials, dirt, and dust.
  6. The Architect/Engineer is to review items which the Prime Contractor proposes removing labels before they are removed.
  7. Maintain cleaning until date of Substantial Completion or the date of partial occupancy of the building, whichever is earlier. Re-cleaning will not be required after the Work has been inspected and accepted, unless later operations of the Contractor make re-cleaning of certain portions necessary.

1.03 PREPARATION OF FINAL RECORD DRAWINGS AND RECORD SPECIFICATIONS

- A. The Prime Contractor shall employ the Project A/E to re-draft, in CAD format, the paper copy Record Drawings onto the Bid Drawings to create the final Record Drawings.
- B. The Prime Contractor shall employ the Project A/E to retype the paper Record Specifications to indicate all revisions to the Bid Specifications. Items changed shall be marked by a double strike through and revised language inserted in red letters.
- C. An Allowance to cover the costs of the re-drafting of Drawings and revisions to the Specification will be provided and shall be included in the Prime Contractors Bid. Final Allowance cost payments will be based on actual documented A/E costs for their work. The Allowance payment will be adjusted accordingly. This Allowance shall be listed as a separate line item on the Schedule of Values.

01 77 00  
CONTRACT CLOSEOUT

1.04 FINAL CLOSEOUT

- A. Final Closeout date shall be as listed in Section 00 10 10 1.01
- B. At Final Closeout the Contractor shall submit to the Owner, via the Architect/Engineer if applicable:
  - 1. One (1) hard copy of the reviewed and accepted O&M Manual in 3-ring binder(s)
  - 2. One (1) copy on a USB Flash Drive of the complete Project Documentation in PDF format, except as noted in item "o" below, including but not limited to:
    - a. Design Meeting Notes (the Contractor shall coordinate with the A/E to obtain)
    - b. Pre-Bid meeting documents
    - c. The Contractor's Project Bidding Documents including Addenda.
    - d. Award documentation
    - e. Required submissions as detailed in the Award Letter
    - f. Pre-Construction meeting documents and
    - g. Progress meeting notes and Construction observation notes.
    - h. All Change items, e.g. ASI, RFI, RFQ, CP, CO, etc., with documentation
    - i. Pay Applications
    - j. Reviewed and accepted O&M Manual,
    - k. Warranties,
    - l. Extended Service and Maintenance Contracts
    - m. Record Specifications
    - n. A scanned copy of the marked-up Record Drawings
    - o. Record Drawings in both PDF and CAD format
  - 3. The Prime Contractor shall retain the paper copies of the Record Drawings and Record Specifications for a minimum of seven (7) years in a safe location and produce these documents upon request by the Owner.

PART 2 – NOT USED

PART 3 – NOT USED

END OF SECTION 01 77 00

01 77 00  
CONTRACT CLOSEOUT

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05 41 00  
METAL STUDS FOR INTERIOR WALLS

PART 1 – GENERAL

1.01 PRODUCT HANDLING

- A. Protection: Use all means necessary to protect metal studs before, during and after installation and to protect the installed work and materials of all other trades.
- B. 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 – PRODUCTS

2.01 METAL STUDS

- A. Standards: All metal studs and accessories shall meet or exceed the minimum requirements of Federal Specifications QQS-698 and QQS-775d, class d, for the items and use intended.
- B. Materials:
  - 1. All metal studs and accessories, unless otherwise specifically approved by the Architects, shall be galvanized steel.
  - 2. Studs and runners shall be channel-type, roll-formed 20 gauge (standard) size.
  - 3. All furring channels shall be 25 gauge.
  - 4. Steel runners and hangers shall be sizes as indicated on the Drawings.
  - 5. Bridging requirements are to be designed by the supplier. Maximum spacing of bridging is to be 5'-0" o.c. All bridging is to be attached with gauge angles and screws. Minimum attachment to be 18 gauge short angle and (4) TEK screws.

2.02 OTHER MATERIALS

- A. All other materials, not specifically described but required for a complete and proper installation of metal studs, shall be new, first quality of their respective kinds, in strict accordance with the recommendations of the manufacturer of the metal studs used, and subject to approval of the Architect/Engineer.

PART 3 – EXECUTION

3.01 SURFACE CONDITIONS

- A. Inspection:
  - 1. 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.
  - 2. Verify that metal studs may be installed in strict accordance with the original design and the manufacturer's recommendations.

3.02 INSTALLATION

- A. Erect framing and panels plumb, level and square in strict accordance with the approved shop drawings.
- B. Handling and lifting of prefabricated panels shall be done in a manner which will not cause distortion in any manner.
- C. Track shall be securely anchored to the supporting structure as shown on erection drawings. Concrete anchors shall be installed after full compressive strength has been achieved.
- D. At track butt joints, abutting pieces of track shall be securely anchored to a common structural element, or they shall be butt-welded or spliced together.

METAL STUDS FOR INTERIOR WALLS

- E. Studs shall be plumb, aligned and securely attached to the flange or webs of both upper and lower tracks.
- F. Jack studs or cripples shall be installed below window sills, above window and door heads, at free standing stair rails and elsewhere to furnish support, and shall be securely attached to supporting members.
- G. Wall stud bridging shall be attached in a manner to prevent stud rotation. Bridging rows shall be spaced according to the manufacturer's recommendations.
- H. Framed wall openings shall include headers and supporting studs as shown on the plans.
- I. Temporary bracing shall be provided until erection is complete.
- J. Provisions for structure vertical movement shall be provided at the top of each panel section and where indicated on the plans using a vertical slide clip or other means in accordance with the manufacturer's recommendations. Allow for a minimum of 1/2" structure deflection.
- K. Provide double studs at wall openings, door and window jambs and not more than 1 1/2" each side of openings and wall intersections.
- L. Coordinate erection of studs with requirements of door frame supports and attachments.

END OF SECTION 05 41 00

07 21 16  
BATT INSULATION

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Work Included: Provide all materials, labor, and equipment necessary to install fibrous insulation as required by the intent of the Contract Documents.

1.02 PRODUCT DELIVERY AND STORAGE

- A. Containers shall be factory marked to identify material, type, grade, and manufacturer.
- B. Protect the materials of this Section from exposure to the elements. Do not store on the ground.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Fibrous Insulation
  - 1. Material: Fiberglass
  - 2. Type: Batt or rolls - foil or reinforced paper faced vapor barrier on all exterior planes.
  - 3. Thickness: Shall be equal to the nominal thickness of the cavity in which it is placed, unless noted otherwise in the Contract Documents
  - 4. Standards: Federal Specification HH-I-521F & ASTM C665.
- B. Fibrous Insulation
  - 1. Material: Mineral Fiber
  - 2. Type: Batt-creased, unfaced, 3.0 pcf
  - 3. Thickness: 3"
- C. Standards:
  - 1. Thermafiber SAFB by USG Acoustical Products Company and Pyro-Fiber Sound Control Blanket by Johns Manville Company

PART 3 – EXECUTION

3.01 INSPECTION

- A. 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.
- B. In the event of a discrepancy, immediately notify the Architect. Do not proceed with the installation until all discrepancies have been resolved.

3.02 INSTALLATION

- A. Install insulation in continuous unbroken plane as indicated on the drawings.
- B. Lap and seal all joints between batts or rolls and at ends of rolls or batts.
- C. Stuff all holes, cracks or recesses with insulation.
- D. Fit insulation tightly around all penetrations (pipes, conduits, joists, etc.) of the insulation plane.
- E. For vertical installation, staple, glue, or wire insulation in place.
- F. Except as otherwise specifically directed by the Architect, install all insulation in accordance with the manufacturer's recommendations.
- G. Kraft faced vapor barriers shall not be installed within any wall of fire-rated construction.

END OF SECTION 07 21 16

07 21 16  
BATT INSULATION

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07 92 00  
SEALANTS

PART 1 – GENERAL

1.01 DESCRIPTION

A. Work Included:

1. The purpose of sealant in this work is to provide a positive barrier against penetration of moisture at joints between items where sealant is essential to the continued integrity of the barrier.
2. Such sealant may be performed under the work of various sections of these specifications, but must be performed in strict accordance with the provisions of this section.

B. Related Work Specified Elsewhere:

1. Section 09 26 00 Acoustical Treatment for Partitions/Ceilings

1.02 PRODUCT HANDLING

A. Use all means necessary to protect sealant materials before, during, and after installation and to protect the installed work and materials of all other trades.

B. 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.

C. Storage:

1. Store all sealant materials and equipment under conditions recommended by its manufacturer.
2. Do not use materials stored for a period of time exceeding the maximum recommended shelf-life of the material.

1.03 SUBMITTALS

A. Submit product literature to the Architect in accordance with Section 01 32 00 of these specifications.

PART 2 – PRODUCTS

2.01 MATERIALS

A. All sealant materials, unless otherwise specifically approved by the Architect, shall be single or double component, non-sagging type in neutral color or other color as approved by the Architect where exposed to view.

B. Sealants:

1. Acrylic Latex: One-part, gun-grade, nearly 100 percent recover from 100 percent elongation, excellent paintability, service temperature range zero to +180 degrees fahrenheit (such as Sonneborn Sonolac)
2. Urethane: Two part, gun-grade, such as Sonneborn Sonolastic NP-2
3. Silicone (exterior and interior): One part, gun-grade, such as Sonneborn Sonolastic Omniseal
4. Silicone (interior at areas where moisture is present): One part, gun-grade, mildew and fungus resistant, such as Sonneborn Sololastic Omnipus
5. Polyurethane: One part pourable, such as Sonneborn Sonolastic SL1
6. Polysulfide: Two-part gun grade; ANSI A116.1 and Thiokol Building-Trade Performance Specification (such as Sonneborne Sonolastic Two-Part)

C. Primers: Quick-drying, clear, as recommended by the sealant manufacturer.

07 92 00  
SEALANTS

- D. Backer Rods: Closed-cell polyethylene or urethane foam, polyvinyl chloride, or closed-cell neoprene; circular in cross section and of sizes to assure that they will stay in place under pressure of applying sealants.

2.02 EQUIPMENT

- A. All sealant equipment shall be only such equipment as is specifically recommended by the manufacturer of the sealant material being installed.

PART 3 – EXECUTION

3.01 SURFACE CONDITIONS

- A. Inspections:
  - 1. 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.
  - 2. Verify that sealant may be installed in accordance with the manufacturer's recommendations.
- B. Discrepancies:
  - 1. In the event of discrepancy, immediately notify the Architect.
  - 2. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.

3.02 PREPARATION

- A. Primers: Where recommended or required by sealant manufacturer, prime joints with brushes that will reach all surfaces of joint. Mask adjacent surfaces that will not be covered with sealant and that are subject to staining or other damage by primers.
- B. Backer Rods: Install firmly and evenly in place where indicated or required to depths and contours recommended by sealant manufacturer. Use backer rods for all exterior caulking work.

3.03 SEALANT LOCATIONS

- A. Acrylic Latex: Interior work, where exposed to view; use at contacts of counter tops, backsplashes and endsplashes (where moisture is not present) and walls adjacent thereto; interior control joints and periphery joints at doors and windows. (Colors as selected by Architect).
- B. Silicone: Interior work, where not exposed to view; for all acoustical caulking, where acoustical drywall abuts floors and ceilings and where penetrations occur in such walls, such as electrical boxes, fire extinguishers, cabinets, etc.
- C. Silicone (exterior): One part, construction grade: metal flashings. (Color as selected by Architect).
- D. Silicone (interior where moisture is present): At countertops, backsplashes and endsplashes and walls adjacent thereto, and around all plumbing fixtures.
- E. Urethane, two-part, gun-grade: Exterior masonry and concrete work (except joints in horizontal concrete slabs); vertical control joints; color as selected by Architect.
- F. Polyurethane, one-part pourable: Exterior concrete flatwork.

3.04 APPLICATION

- A. Apply sealants with guns or other devices having nozzles of size to allow joints to be completely filled with single bead of material. Use sufficient pressure to drive materials completely and fully into joints so that joints are weathertight and watertight. Point joints at

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SEALANTS

flush vertical surfaces slightly concaved; point joints at flush horizontal surfaces slightly convexed so that moisture will not "pond" thereon; uniformly smooth and straight, free from wrinkles and sags. Finished installations of acoustical caulking shall maintain indicated STC ratings.

3.05 APPLICATION LIST

- A. Specific applications listed hereinafter are to be used as a bidding and application aid and are not intended to necessarily represent all required sealant applications.
1. Exterior and Interior control joints.
  2. Periphery joints at exterior steel frames, exterior aluminum frames, interior steel frames, interior aluminum frames, windows, louvers and similar wall penetrations.
  3. Plumbing fixture to wall joints.
  4. Counter top and counter top backsplash to wall joints.
  5. Exterior wall penetrations.
  6. Cut stone to cut stone joints and stone to brick joints.
  7. Perimeter stone to wall joints.
  8. All applications indicated on drawings, other locations standard to the industry and as directed by the Owner.

3.06 COMPLETION OF WORK

- A. Remove excess sealants from joints. Remove sealant deposits from surfaces not intended to be caulked and restore such surfaces to their original conditions.

END OF SECTION 07 92 00

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SEALANTS

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08 11 13  
HOLLOW METAL DOORS AND FRAMES

PART 1 – GENERAL

1.01 WORK INCLUDED

- A. Furnish all labor, materials, services, equipment and apparatus whether necessary or incidental to complete installation of all hollow metal doors and frames required for the project as shown on the Drawings and specified herein.
- B. Non-rated steel doors

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Division 00 - Bidding and Contract Requirements, including the General Conditions of the Contract
- B. Division 01 - General Requirements
- C. Section 06 10 00 - Rough Carpentry
- D. Section 07 92 00 - Joint Sealants
- E. Section 08 14 16 - Flush Wood Doors
- F. Section 08 71 00 - Finish Hardware
- G. Section 08 81 00 - Glass and Glazing
- H. Section 09 21 16 - Gypsum Wallboard Systems
- I. Section 09 91 23 - Painting and Finishing

1.03 SITE INSPECTION

- A. This Contractor shall visit the site and become thoroughly familiar with all conditions. Refer to Division 1 for site examination requirements and procedures.

1.04 REFERENCE STANDARDS

- A. ANSI/S.D.I. 100 - RECOMMENDED SPECIFICATIONS STANDARD STEEL DOORS AND FRAMES, Steel Door Institute.
- B. ANSI A115 - STANDARD SPECIFICATION FOR DOOR AND FRAME PREPARATION FOR HARDWARE, American National Standards Institute.
- C. Thermal rated assemblies ASTM C236-89 or ASTM C976-90

1.05 SUBMITTALS

- A. Manufacturer's written certification that materials meet Specification requirements
- B. Submit under provisions of Section 01 32 00
- C. Shop Drawings: Indicate door elevations, internal reinforcement, closure method, and cutouts for glazing, and finish.
- D. Product Data: Indicate door configurations, location of cut-outs for hardware reinforcement.
- E. Manufacturer's installation instructions: indicate special installation instructions.
- F. Manufacturer's certificate: Certify that products meet or exceed specified requirements.

1.06 QUALITY ASSURANCE

- A. Installer: Company specializing in hollow metal door and frame work of comparable scope with a minimum of three (3) years experience.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, protect, and handle products to site under provisions of Section 01600.
- B. Accept doors on site in manufacturer's packaging. Inspect for damage.

08 11 13  
HOLLOW METAL DOORS AND FRAMES

C. Break seal on-site to permit ventilation.

1.08 FIELD MEASUREMENTS

A. Verify that field measurements are as indicated on shop drawings.

1.09 COORDINATION

A. Coordinate the work with door opening construction, door frame and door hardware installation.

PART 2 - PRODUCTS

2.01 MATERIALS - INTERIOR DOORS - GENERAL

A. Sheet Steel: Commercial quality carbon steel, cold-rolled, annealed, and free from scale, pitting, rust or other defects - ASTM A366

1. Gauges:

- a. Interior frames - 18 gauge, mitered corners.
- b. Interior doors - (Non-rated): SDI-100 Grade II, 18 gauge, heavy duty 1-3/4" (44mm) (Level B), Model 3 - Seamless .
- c. Reinforcement for hardware - in accordance with Steel Door Institute Standard (S.D.I.) 100, Table IV.
- d. Glass Moldings - 20 gauge.

B. Primer:

1. For non-galvanized steel, primer shall be manufacturer's standard rust-resistant metallic or phenol-resin primer.
2. For galvanized steel, primer shall be zinc dust oxide primer, such as Porter No. 299 Zinc-dust Primer.
3. Air dried.

C. Core Filler Material:

1. Non-insulated doors - manufacturer's standard cardboard honeycomb.
2. Core material shall completely fill the inside of the door and be laminated to both inside faces of the panels.

D. Acceptable manufacturers:

1. Steelcraft of Masco Industries
2. Republic Builders Products
3. Ceco Corporation.
4. Curries of L.B. Foster Co.
5. Fenestra Corporation
6. Emerson Engineering Company, Inc.

PART 3 – EXECUTION

3.01 FABRICATION

A. Frames shall be set up, arc welded and ground smooth and shall have spreaders attached. Provide frame anchors of the proper type for adjoining construction. No less than three (3) wall anchors per jamb or frames to 7'-4" high, four (4) anchors per jamb for frames over 7'-4" high.

HOLLOW METAL DOORS AND FRAMES

- B. Doors shall be full flush type, with seams finished so as to be invisible.
  - 1. Close top and bottom edges of door with steel channel, minimum 18 gauge, extending full width of door, and spot welded to both faces.
  - 2. Provide bevel on swing side.
  - 3. Provide adequate bracing.
  - 4. Fabricate doors with hardware reinforcement welded in place.
- C. Provide for hardware specified in Section 087100 - Finish Hardware. Provide reinforcing for hardware in accordance with ANSI A115.
- D. Provide UL labels of non-rusting metal attached with pop rivets on both doors and frames where indicated. Unless otherwise scheduled, "B label" shall be "1-1/2 hour B label".
- E. Provide screw-on glazing stops with mitered corners. Locate stops on non-security side of opening.
- F. Finishing:
  - 1. Thoroughly clean all contaminates from surface by washing with clean solvent and wiping with clean cloths.
  - 2. Treat non-galvanized items with phosphate pretreatment.
  - 3. All doors and frames shall receive a factory applied primer.
  - 4. All concealed parts of frames to be installed in masonry walls shall be coated with bituminous paint.
- G. Furnish galvanized steel shims as required to maintain 1/8" clearance between frame and door and between pairs of doors.
- H. Where indicated, provide inserted type sightproof stationary metal louvers.
- I. For openings which are to be equipped with electric door locks, modify standard frame and door construction as is necessary to accommodate the electric locks.
- J. Steel sheet: Galvanized to ASTM A525 G60.

## 3.02 INSTALLATION

- A. Anchor work securely to adjacent construction.
- B. Set frames accurately, plumb and square. Brace until attached to adjacent construction.
- C. Install doors in accordance with ANSI/SDI-100 and DHI.
- D. Do not use cardboard or other unspecified material for shims.
- E. Install metal doors and frames in accordance with the following standards published by the Steel Door Institute: Frames, SDI 105; Hardware, SDI 107; Doors, SDI 100.
- F. Frames installed in existing masonry walls shall be grouted in on both sides to provide a sealed installation. Grout used shall meet rating of the door and frame assembly.
- G. Coordinate installation of doors with installation of frames and hardware specified in Section 08 71 00.

## 3.03 DISPOSAL

- A. All waste materials shall be properly and legally recycled or disposed of off the site by the Contractor. Burning on the site will not be allowed.

## 3.04 EXAMINATION

- A. Verify substrate conditions.

08 11 13  
HOLLOW METAL DOORS AND FRAMES

- B. Verify that opening sizes and tolerances are acceptable. ERECTION TOLERANCES
  - C. Maximum Diagonal Distortion: 1/16 inch (1.5 mm) measured with straight edge, corner to corner.
- 3.05 ADJUSTING
- A. Adjust work under provisions of Section 01 77 00.
  - B. Adjust door for smooth and balanced door movement.

END OF SECTION 08 11 13



08 14 29  
FLUSH WOOD VENEER DOORS

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Interior Flush Wood Veneer Doors
  - 1. 5-ply flush bonded particle-core doors.
  - 2. Flush fire-rated wood doors.
  - 3. Lead-lined doors.
  - 4. Sound-retardant doors.
  - 5. Profiled doors.

1.02 RELATED SECTIONS

- A. Section 08 11 13 – Metal Frames.
- B. Section 08 71 00 / 08 71 01 – Door Hardware/Hardware Specifications Guidelines.
- C. Section 08 81 00 – Glazing.
- D. Section 08 91 19 – Door Louvers.

1.03 REFERENCES

- A. ANSI A208.1 – Particleboard.
- B. ASTM E 90 – Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
- C. ASTM E 413 – Classification for Rating Sound Insulation.
- D. AWI Section 1300 – Architectural Flush Doors.
- E. UBC 7-2-1997/UL 10C – Positive Pressure Fire Tests of Door Assemblies.
- F. WDMA Finish System TR-6, transparent – Catalyzed Polyurethane.
- G. WDMA I.S.1-A – Architectural Wood Flush Doors.

1.04 SUBMITTALS

- A. Comply with Section 01 32 00 – Submittal Procedures.
- B. Product Data: Submit manufacturer's product data, including door construction description and WDMA I.S.1-A and AWI classifications.
- C. Schedules: Submit manufacturer's schedules, including door dimensions, cutouts, species, finish, and hardware. Reference individual door numbers as indicated on the Drawings.
- D. Samples: Submit manufacturer's door finish samples, showing range of color variation.
- E. Test Reports: Submit manufacturer's test results of STC ratings from testing performed by independent testing agency for sound-retardant doors.
- F. Manufacturer's Certification: Submit manufacturer's certification that doors comply with specified requirements and are suitable for intended application.
- G. Cleaning Instructions: Submit manufacturer's cleaning instructions for doors.
- H. Warranty: Submit manufacturer's standard warranty.

1.05 QUALITY ASSURANCE

- A. Tolerances for Warp, Telegraphing, Squareness, and Prefitting Dimensions: WDMA I.S.1-A.

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FLUSH WOOD VENEER DOORS

- B. Identifying Label: Each door shall bear identifying label indicating:
  - 1. Door manufacturer.
  - 2. Order number.
  - 3. Door number.
  - 4. Fire rating, if applicable.
- C. Fire-Rated Doors: Labeled by Intertek/Warnock Hersey.
  - 1. Construction Details and Hardware Application: Approved by labeling agency.
- D. Positive Pressure Opening Assemblies: UBC 7-2-1997/UL 10C.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Delivery:
  - 1. Deliver doors to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.
  - 2. Package doors individually in polybags.
- B. Storage:
  - 1. Store doors in accordance with manufacturer's instructions.
  - 2. Store doors in clean, dry area indoors, protected from damage and direct sunlight.
  - 3. Store doors flat on level surface.
  - 4. Do not store doors directly on concrete.
  - 5. Keep doors completely covered. Use covering which allows air circulation and does not permit light to penetrate.
  - 6. Store doors between 50 and 90 degrees F (10 and 32 degrees C) and 25 to 55 percent relative humidity.
- C. Handling:
  - 1. Handle doors in accordance with manufacturer's instructions.
  - 2. Protect doors and finish during handling and installation to prevent damage.
  - 3. Handle doors with clean hands or clean gloves.
  - 4. Lift and carry doors. Do not drag doors across other doors or surfaces.

1.07 ENVIRONMENTAL REQUIREMENTS

- A. Do not subject doors to extreme conditions or changes in temperature or relative humidity in accordance with WDMA I.S.1-A.

1.08 WARRANTY

- A. Warrant solid core, interior doors for life of installation against warpage, delamination, and defects in materials and workmanship.
- B. Defects noted during warranty period shall be corrected at no cost to Owner. Corrective work shall include labor and material for repair, replacement, refinishing, and rehangng as required.

PART 2 – PRODUCTS

2.01 MANUFACTURER

- A. VT Industries, Inc.
- B. Algoma Hardwoods
- C. Eggers

08 14 29  
FLUSH WOOD VENEER DOORS

- D. Oshkosh
- E. Others must submit for approval

2.02 GENERAL

- A. Glass Mouldings:
  - 1. Non-rated Flush Doors: VT Industries Style VT1.
  - 2. Fire-Rated Doors: VT Industries Style 110, steel vision frame, beige finish.
- B. Glazing: As specified in Section 08 81 00
- C. Door Louvers: As specified in Section 08 91 19

2.03 5-PLY FLUSH BONDED PARTICLE-CORE DOORS

- A. 5-Ply Flush Bonded Particle-Core Doors:
  - 1. Compliance: WDMA I.S.1-A.
    - a. Quality Grade: Premium grade, extra heavy duty.
    - b. Type: PC-5ME.
  - 2. 7-Ply and Non-Bonded Core Construction: Not acceptable.
  - 3. Door Thickness: 1-3/4 inches.
  - 4. Stiles:
    - a. Inner Stiles: 1-3/8 inches wide, before prefitting.
    - b. Structural Composite Lumber (SCL) With Outer Stile: Same species as face veneer.
    - c. Outer Stile: Apply after beveling and before face application.
  - 5. Rails:
    - a. Structural composite lumber (SCL).
    - b. Minimum Width Before Prefitting: 1-3/8 inches.
  - 6. Core:
    - a. Material: Particleboard
    - b. Particleboard Compliance: ANSI A208.1, Grade 1-LD-2
  - 7. Door Assembly:
    - a. Glue stiles and rails to core.
    - b. Sand entire assembly flat as a unit to ensure minimal telegraphing of core components through face veneers.
  - 8. Composite Crossbands:
    - a. Apply to core before application of matching hardware stiles.
    - b. Exposed Crossbanding: Not allowed along stile edges.
  - 9. Veneers:
    - a. Apply to crossbanded core in hot press using Type I, exterior, water-resistant adhesive.
    - b. 5-ply construction.
  - 10. Face Veneers:
    - a. Plain Sliced Red Oak (ISU Standard)
    - b. Others as selected by the Architect/Owner
    - c. Minimum Thickness Before Sanding: 1/42 inch.

2.04 FLUSH FIRE-RATED WOOD DOORS

- A. Flush Fire-Rated Wood Doors:
  - 1. Compliance: WDMA I.S.1-A.
    - a. Quality Grade: Premium.
    - b. Type: FD-5.
  - 2. Door Thickness: 1-3/4 inches.

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FLUSH WOOD VENEER DOORS

3. Outer Stiles: Same species as face veneer.
4. Inner Stiles:
  - a. Noncombustible material, 60- and 90-minute rated
  - b. Warranted for use with standard-weight mortise butt hinges and No. 12, 1-1/4-inch steel threaded-to-head screws.
5. Rails:
  - a. Noncombustible material, 60- and 90-minute rated
  - b. Width: Manufacturer's standard width.
6. Core:
  - a. Non-combustible mineral board
  - b. Weight: 30.8 pcf to 34.7 pcf
  - c. Does not contain asbestos or added urea formaldehyde.
7. Composite Crossbands:
  - a. Apply to core before application of matching hardware stiles.
  - b. Exposed Crossbanding: Not allowed along stile edges.
8. Face Veneers:
  - a. Plain Sliced Red Oak (ISU Standard)
  - b. Others as selected by the Architect/Owner
  - c. Minimum Thickness Before Sanding: 1/42 inch.
9. Positive Pressure:
  - a. Where UBC 7-2-1997/UL 10C standards for positive pressure apply, doors shall be constructed in accordance with Category A guidelines as published by Intertek/Warnock Hersey.
  - b. Smoke Gasketing: Apply smoke gasketing around frame perimeter to meet S-rating.
  - c. Intertek/Warnock Hersey Category B Guidelines: Edge sealing systems not allowed on frames.

#### 2.05 SOUND-RETARDANT DOORS

- A. Sound-Retardant Doors:
  1. Compliance: WDMA I.S.1-A.
    - a. Quality Grade: Premium.
  2. Testing Methods: ASTM E 90 and E 413.
  3. Door Thickness: 1-3/4 inches.
  4. STC Rating: 45
  5. Core: Sound absorbent material encapsulated by stiles, rails, crossbands, and face veneers.
  6. Perimeter Gasketing and Drop Seals: To achieve STC ratings.
  7. Face Veneers and Vertical Stile Edges: Compatible with non-rated fire-rated doors.
  8. Acoustical Lite Kit if required shall be provided.

#### 2.06 FABRICATION

- A. Prefit Doors:
  1. Prefit and bevel doors at factory to fit openings.
  2. Prefit Tolerances: WDMA I.S.1-A and AWI Section 1300.
- B. Factory-machine doors for mortised hardware, including pilot holes for hinge screws and lock fronts.

#### 2.07 FINISHES

- A. Doors shall receive factory finishing.

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FLUSH WOOD VENEER DOORS

- B. Factory Finishing: WDMA System TR-6, catalyzed polyurethane, premium grade. WDMA finish Types 2 and 3 are not acceptable.
  - 1. Stain coat. (if specified) Stain Color to be selected
  - 2. Sealer: 3 coats.
  - 3. Sanding: 320-grit sandpaper.
  - 4. Topcoat: 2 coats.
- C. Top and Bottom Rails: Factory sealed with wood sealer.

**PART 3 – EXECUTION**

**3.01 EXAMINATION**

- A. Examine locations to receive doors. Notify Architect of conditions that would adversely affect installation or subsequent use. Do not begin installation until unacceptable conditions are corrected.
- B. Ensure frames are solidly anchored, allowing no deflection when doors are installed.
- C. Ensure frames are plumb, level, square, and within tolerance.

**3.02 PREPARATION**

- A. Allow doors to become acclimated to building temperature and relative humidity for a minimum of 24 hours before installation.

**3.03 INSTALLATION**

- A. Install doors in accordance with manufacturer's instructions.
- B. Install doors at locations indicated on the Door Schedule or Drawings.
- C. Install doors plumb, level, square, true to line, without warp or rack.
- D. Seal exposed surfaces with a minimum of 2 coats of polyurethane within 4 days of fitting each door.
- E. Install door hardware as specified in Section 08 71 00 and 08 71 01.

**3.04 ADJUSTING**

- A. Adjust doors to swing freely, without binding in frame.
- B. Adjust hardware to operate properly.
- C. Repair minor damages to finish in accordance with manufacturer's instructions and as approved by Architect.
- D. Remove and replace damaged doors that cannot be successfully repaired, as determined by Architect.

**3.05 CLEANING**

- A. Clean doors promptly after installation in accordance with manufacturer's instructions.
- B. Do not use harsh cleaning materials or methods that could damage finish.

**3.06 PROTECTION**

- A. Protect installed doors from damage during construction.
- B. Place polybags over doors after adjusting and cleaning.

END OF SECTION 08 14 29

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FLUSH WOOD VENEER DOORS

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08 71 00  
FINISH HARDWARE

PART 1 – GENERAL

1.01 SUMMARY

- A. Section Includes: Basic finish hardware requirements.
- B. Related Sections:
  - 1. Section 06 20 00 - Finish Carpentry: Installation of finish hardware.
  - 2. Section 08 11 13 - Hollow Metal Doors and Frames.
  - 3. Section 08 14 16 - Wood Doors.
  - 4. Section 08 14 29 - Veneer Wood Doors
  - 5. Section 08 71 01 - Hardware Specification Guidelines
- C. Specific Omissions: Hardware for the following is specified or indicated elsewhere.
  - 1. Windows
  - 2. Cabinets of all kinds, including open wall shelving and locks.
  - 3. Signs, except as noted.
  - 4. Toilet accessories of all kinds including grab bars.
  - 5. Rough hardware.
  - 6. Folding partitions, except cylinders where detailed.
  - 7. Sliding aluminum doors.
  - 8. Angle sill threshold.
  - 9. Corner guards.

1.02 SUBMITTALS

- A. Submit in electronic format (PDF) the hardware schedule at earliest possible date prior to delivery of hardware. Organize schedule into "Hardware Sets" with an index of doors and heading, indicating complete designations of every item required for each door or opening. Include the following information:
  - 1. Type, style, function, size, quantity and finish of each hardware item.
  - 2. Name, part number and manufacturer of each item.
  - 3. Location of hardware set cross referenced to indications on drawings both on floor plans and in door schedule.
  - 4. Explanation of all abbreviations, symbols, and codes contained in schedule.
  - 5. Mounting locations for hardware.
  - 6. Door and frame sizes and materials.
  - 7. Submit manufacture's technical data and installation instructions for the electronic hardware.
  - 8. Provide samples of hardware for Owner review.
  - 9. Catalog cuts.
- B. Templates: Where required, furnish hardware templates to each fabricator of doors, frames and other work to be factory-prepared for the installation of hardware.

1.03 QUALITY ASSURANCE

- A. Qualifications:
  - 1. Obtain each kind of hardware (latch and locksets, exit devices, hinges, and closers) from only one manufacturer, although several may be indicated as offering products complying with requirements.

08 71 00  
FINISH HARDWARE

2. Hardware supplier shall be a direct factory contract supplier who has in his employment a certified architectural hardware consultant (AHC) who is available at all reasonable times during the course of the Work, and for project hardware consultation to the Owner, Architect, and Contractor.

- B. Schedule Designations: Except as otherwise indicated, the use of one manufacturer's numeric designation system in schedules does not imply that another manufacturer's products will not be acceptable, unless they are not equal in design, size, weight, finish function, or other quality of significance. See 1.02 A for substitutions.
- C. Exit Doors: Openable at all times from the inside without the use of a key or any special knowledge or effort.
- D. Fire-rated openings: Provide hardware for fire-rated openings in compliance with NFPA Standard No. 80. This requirement takes precedence over other requirements for such hardware. Provide only such hardware which has been tested and listed by UL for the type and size of door required, and complies with the requirements of the door and the door frame labels. Latching hardware, door closers, ball bearing hinges, and seals are required whether or not listed in the Hardware schedule.
  - 1. Where panic exit devices are required on fire-rated doors, provide supplementary marking on door UL label on exit device indicating "Fire Exit Hardware."

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Acceptance at the Site: Individually package each unit of finish hardware complete with proper fastening and appurtenances, clearly marked on the outside to indicate contents and specific locations in the Work.
- B. Deliver packaged hardware items at the times and to the locations (shop or field) for installation, as directed by the Contractor.

1.05 PROJECT CONDITIONS

- A. Coordination: Coordinate hardware with other work. Furnish hardware items of proper design for use on doors and frames of the thickness, profile, swing security and similar requirements indicated, as necessary for the proper installation and function, regardless of omissions or conflicts in the information on the Contract Documents.
- B. Upon request, check the Shop Drawings for doors and entrances to confirm that adequate provisions will be made for the proper installation of hardware.

1.06 PRE-INSTALLATION MEETING

- A. Schedule a hardware pre-installation meeting on site and discuss the installation of all types of hardware on the Project.
- B. Meeting attendees shall be notified seven (7) days in advance and shall include the Architect, Contractor Hardware Installers, all Manufacturers Representative, any other effected sub-contractor or supplier and the Owner's Locksmith.

1.07 WARRANTY

- A. Provide guarantee from hardware supplier as follows:
  - 1. Closers: Ten years; except electronic closers: Two years.
  - 2. Exit Devices & Locksets: Three years
  - 3. All other Hardware: Two years.



08 71 00  
FINISH HARDWARE

PART 2 – PRODUCT

2.01 MANUFACTURERS

- A. The approved Manufacturers are listed in every item of this Part 2 Specification Section. These Manufacturers are based on Owner's building standards for door hardware. The Owner maintains this hardware and is currently stocking replacement parts.
- B. All others must submit for approval a minimum of ten (10) calendar days prior to Bid Date.

2.02 HANGING DEVICES

A. Mortise Hinge

- 1. Heavy Weight Exterior
  - a. Stanley FBB199
  - b. McKinney TA3386
  - c. Hager BB1199
- 2. Standard Weight Exterior
  - a. Stanley FBB191
  - b. McKinney TA2314
  - c. Hager BB1191
- 3. Heavy Weight Interior
  - a. Stanley FBB168
  - b. McKinney TA3786
  - c. Hager BB1168
- 4. Standard Weight Interior
  - a. Stanley FBB179
  - b. McKinney TA2714
  - c. Hager BB1279

**Notes:**

- Provide DHI recommended size for height and width of door.
- Provide proper quantity of hinges for height of door.
- NRP (Non Removable Pin) at Reverse bevel locked Doors.
- Hinge tips to match existing for additions and alterations to existing buildings.
- Field verify size and finish of existing for door only replacement projects.

B. Continuous Hinge

- 1. Full Surface
  - a. Stanley 664HD
  - b. Select SL21HD
  - c. Hager 780-057HD
  - d. Pemko \_ FS
- 2. Full Mortise- Hollow Metal Doors
  - a. Stanley 662HD
  - b. Select SL24HD
  - c. Hager 780-224HD
  - d. Pemko \_ FM

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FINISH HARDWARE

3. Full Mortise- Wood Doors
  - a. Stanley 661HD
  - b. Select SL11HD
  - c. Hager 780-111HD
  - d. Pemko FM \_ SLF / SLI

**Notes:**

- Continuous hinges are to be used at exterior openings and vestibule entrances only.
- Continuous hinges are NOT to be used at interior openings other than vestibules for exterior entrances
- Use continuous hinges on perimeter doors unless there is an historic requirement.
- Use continuous hinges on interior high cycle openings.
- Field verify requirements for Pivots and Floor Closers for additions and alterations to existing buildings.
- Avoid floor closers and pivots on new construction.

2.03 LOCKSETS

A. Mortise Lock

1. Best Series 45H (*No Substitutions*)
  - a. Design 15J Full Escutcheon
  - b. Design 15H Sectional Trim
2. Function Designation
  - a. Passage Best: N
  - b. Office Best: AT
  - c. Privacy Best: LT
  - d. Privacy – Staff Best: H-VIN
  - e. Storeroom Best: D

**Note:** Provide lock functions as required for project and space as appropriate

B. Electronic Mortise Lock

1. Best Series 45HW (*No Substitutions*)
  - a. Design 15J Full Escutcheon
  - b. Design 15H Sectional Trim
2. Function Designation
  - a. Fail Secure Best: DEU
  - b. Fail Safe Best: DEL

**Note:** Specify quick connect wire connections for low voltage terminations.

Best “C”

Corbin Russwin “Lynx”

C. Cylindrical Lock

1. Best Series 9K (*No Substitutions*)
  - a. Design 15D Flat Lever w/Return
  - b. Design 16D Straight Lever

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2. Function Designation

- a. Passage Best: N
- b. Office Best: AB
- c. Privacy Best: L
- d. Privacy – Staff Best: H
- e. Storeroom Best: D

**Note:** Provide lock functions as required for project and space as appropriate

D. Electronic Cylindrical Lock

1. Best Series 9K (No Substitutions)

- a. Design 15D Full Escutcheon
- b. Design 16D Sectional Trim

2. Function Designation

- a. Fail Secure Best: DEU
- b. Fail Safe Best: DEL

**Note:** Specify quick connect wire connections for low voltage terminations.  
Best "C"

E. Cylinders

- 1. Best Mortise Cylinders 1E Series (*No Substitutions*)
- 2. Rim Cylinders 12E Series (*No Substitutions*)

**Note:** Provide as necessary to operate locking hardware

F. Key System

- 1. Best (*No Substitutions*)
  - a. Small Format Interchangeable Core
  - b. 7-pin Best SFIC

**Note:** Cores must be supplied as part of the construction hardware

2.04 EXIT DEVICES

A. Exit Devices

1. **Precision Apex Series 2000**

- |   |        |
|---|--------|
| a. Rim Device                                   | 2100   |
| b. Rim Device–Fire Rated                        | FL2100 |
| c. Surface Vert Rod Device                      | 2200   |
| d. Surface Vert Rod-Fire Rated                  | FL2200 |
| e. Mortise Device                               | 2300   |
| f. Mortise Device-Fire Rated                    | FL2300 |
| g. Rim Device-Narrow Stile                      | 2400   |
| h. Rim Device–Narrow Stile-Fire Rated           | FL2400 |
| i. Con Vert Rod Device-Narrow Stile             | 2600   |
| j. Con Vert Rod Device -Narrow Stile-Fire Rated | FL2600 |
| k. Con Vert Rod Device-Wood Door                | 2700   |
| l. Con Vert Rod Device -Wood Door-Fire Rated    | FL2700 |
| m. Con Vert Rod Device                          | 2800   |
| n. Con Vert Rod Device-Fire Rated               | FL2800 |

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2. **Von Duprin Series 35 / 98**

a. Rim Device	98
b. Rim Device–Fire Rated	98-F
c. Surface Vert Rod Device	9827
d. Surface Vert Rod-Fire Rated	9827-F
e. Mortise Device	9875
f. Mortise Device-Fire Rated	9875-F
g. Rim Device-Narrow Stile	35A
h. Rim Device–Narrow Stile-Fire Rated	35A-F
i. Con Vert Rod Device-Narrow Stile	3347A
j. Con Vert Rod Device -Narrow Stile-Fire Rated	3347A-F
k. Con Vert Rod Device-Wood Door	9847WDC
l. Con Vert Rod Device -Wood Door-Fire Rated	9847WDC-F
m. Con Vert Rod Device	9847
n. Con Vert Rod Device-Fire Rated	9847-F

3. **Panic Device Function Designation**

a. Exit Only	Precision: 01	Von Duprin: EO
b. Pull Only	Precision: 02	Von Duprin: DT
c. Key Retracts Latch Bolt	Precision: 03	Von Duprin: NL
d. Lever Locked / Unlocked	Precision: 08	Von Duprin: L
e. Lever Always Free	Precision: 15	Von Duprin: L-BE

**Note:** Precision Apex 2000 Series

- For use on new construction projects.
- “A” Lever design on interior applications.
- “A” Pull design on exterior applications.
- Field verify existing pull design on projects where there is an historic requirement.
- Hex Key Dogging on Non-Fire Rated applications.
- Single Doors – Rim style device preferred over mortise panics
- Pairs of Doors – (2) Rim style devices and a Mullion.
- Mullions to be Key Removable.
- Latch bolts on Electrified Exit Devices to use Motor retraction not solenoid retraction unless matching existing

B. Exit Device Accessories

1. Lockdown Panic Button
  - a. Trimco LDH100

**Note:** Must be used in conjunction with all non-fire rated exit devices

2.05 MECHANICAL CLOSING DEVICES

A. Surface Closer

1. Dorma 8900
2. LCN 4040XP
3. Stanley/Dormakaba Commercial Hdw QDC100

**Note:**

- Proper Arm as Required.
- Provide heavy duty EDA Parallel arms.
- Provide SNB at All closers.
- All door frames to be reinforced.

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B. Concealed Closers

1. Dorma RTS88 series
  - a. RTS25 model – Aluminum Storefront Openings
  - b. RTS27 model - Hollow Metal Openings
2. LCN 2000 series
  - a. 2010/2030 models

2.06 AUTOMATIC OPERATORS

A. Low Energy- Automatic Operator

1. Dorma ED900
2. LCN 4642

**Note:**

- Push Plate Actuation
- Provide where noted ADA required on drawings

2.06 STOPS & HOLDERS

A. Door Stops

1. Trimco
2. Rockwood
3. Hager
4. Ives
5. Design Hardware

**Note:**

- Allow for maximum swing of door.
- Can use both floor stops and wall stops
- Backing required at wall stop.

B. Overhead Stops

1. Dorma 700 / 900
2. Rixon 6-x / 9-x
3. Rockwood OH100 / OH900
4. Glynn Johnson 90 / 100

2.07 TRIM & ACCESSORIES

A. For the following items all Manufacturers are approved using their standard product for the item listed.

- |                  |  |
|------------------|--|
| 1. Flat Goods    | Hager, Ives, Rockwood, Design Hardware       |
| 2. Threshold     | National Guard, Pemko, Zero, Design Hardware |
| 3. Weather Seals | National Guard, Pemko, Zero, Design Hardware |
| 4. Door Sweeps   | National Guard, Pemko, Zero, Design Hardware |
| 5. Smoke Seals   | National Guard, Pemko, Zero, Design Hardware |

2.08 ELECTRONIC COMPONENTS

A. Power Transfer

1. Precision EPT-12C
2. Securitron EL-CEPT
3. Von Duprin EPT-10 CON

**Note:** Specify quick connect wire connections for low voltage terminations.

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- B. Door Position Switches
  - 1. Sargent 3280
  - 2. Security Door Controls DPS
  - 3. Securitron DPS
  - 4. RCI 9540

- C. Power Supplies
  - 1. Alarm Controls APS
  - 2. Security Door Controls 630
  - 3. Von Duprin PS
  - 4. Precision PS/RPS series
  - 5. RCI 10-series

2.09 ELECTRIC STRIKES

- A. Electric Strikes
  - 1. Dorma
  - 2. Best
  - 3. RCI
  - 4. Von Duprin

2.10 MISCELLANEOUS

- A. Pad Locks
  - 1. Best 21B series

**Note:** Weather Cover Required for Exterior Applications

2.11 MATERIALS

- A. Locksets: All locksets and latchsets shall be extra-heavy-duty cylindrical with Best 7-pin interchangeable core. Lockset and Cores to be of the same manufacturer to maintain complete lockset warranty. Locks to have solid shank with no opening for access to keyed lever keeper. Keyed lever to be protected by means of a break-away mechanism to prevent forced entry, when excessive torque is applied, a replaceable part will shear. Lock chassis must be through-bolted (outside of the lock chassis prep to prevent rotation of chassis after installation. Lock manufacturer shall provide a three-year warranty, in writing, to the Owner, along with three copies of the lock service manual. Strikes shall be 16 gauge curved brass, bronze or stainless steel with a 1" deep box construction, and have sufficient length to clear trim and protect clothing.
- B. Mortise type Locks and Latches shall be heavy-duty with hinged, anti-friction, 3/4 inch throw latchbolt with anti-friction piece made of self lubricating stainless steel. Functions and design as indicated on the hardware groups. Deadbolt functions shall be 1 inch projection made of hardened stainless steel. both deadbolt and latchbolt are to extend into the case a minimum of 3/8 inch when fully extended. Furnish locksets and latchsets with sufficient curved strike lip to protect door trim. Provide locksets with 7-pin interchangeable core cylinders. All mortise cylinders shall have a concealed internal set screw for securing the cylinder to the lockset. The internal set screw will be accessible only by removing the core from the cylinder body. Locksets and latchsets to have self-aligning, thru-bolted trim. Auxiliary deadlatch to be made of one piece stainless steel, permanently lubricated. Lever handles must be of forged or cast brass, bronze or stainless steel construction. Levers which contain a hollow cavity are not acceptable. Spindle to be such that if forced it will twist first, then break, thus preventing forced entry. Levers to be operated with a roller bearing spindle hub mechanism.
  - 1. Grade 1 Cylindrical Locks shall have minimum 9/16 throw. All deadbolts shall have 1-inch minimum throw.

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FINISH HARDWARE

PART 3 – EXECUTION

3.01 BASIC REQUIREMENTS

- A. Furnish all items of hardware required to complete the work in accordance with specifications and plans.
- B. Carefully inspect Project for the extent of the finish hardware required to complete the Work. Where there is a conflict between these Specification and the existing hardware furnish finish hardware to specification.
- C. Door and frame prep
  - 1. Before hardware installation, verify that all doors and frames are properly prepared to receive the specified hardware. Hollow metal frames shall be prepared for ANSI strike plates per A115.1-2 (4-7/8" high); hinge preps will be mortised and reinforced with a minimum of 10 gauge reinforcement material; minimum of 14 gauge reinforcement material for closer and all surface mounted hardware. Hollow metal doors shall be properly prepared and reinforced with a minimum of 16 gauge material for either mortised or cylindrical locks as specified. All hollow metal doors receiving door closers or other surface mounted hardware to have 14 gauge reinforcement. The use of sex bolts is mandatory. Wood doors shall be factory prepared to receive the scheduled hardware.
- D. Hardware Finishes
  - 1. The finish for the hardware items will be project specific. Field verification is required for additions and alterations of existing buildings.
- E. Hardware installation
  - 1. The manufacturer's representative for the locking devices and closing devices must inspect and approve, in writing, the installation of their products. Hardware installed incorrectly must be reported to the architect prior to the architect's final punch list.
  - 2. Install each hardware item per manufacturer's instructions and recommendations. Do not install surface mounted items until finishes have been completed on the substrate. Set units level, plumb and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.
  - 3. Installation shall conform to local governing agency security ordinance.

3.02 KEYING REQUIREMENTS

- A. Provide construction cores and keys during the construction period. Construction control and operating keys and core shall not be part of the Owner's permanent keying system or furnished on the same keyway (or key section) as the Owner's permanent keying system. Permanent cores and keys (prepared according to the accepted keying schedule) will be furnished by the Best factory representative as part of the hardware package to the General or Prime Contractor for delivery to the Owner a minimum of two (2) weeks prior to occupancy.
- B. All cylinders shall be Best 7-pin, interchangeable core.
- C. Furnish two (2) key blanks per core provided in the proper keyway configuration as directed by the University Locksmith
- D. The Owner, or the Owner's agent, will install permanent cores and return the construction cores to the Best Access Systems Factory Representative. All Construction cores and control keys remain the property of Best Access Systems.

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FINISH HARDWARE

3.03 HARDWARE LOCATION

- A. Hinges:
  - 1. Bottom Hinge: 10 inches from door bottom to bottom of hinge.
  - 2. Top Hinge: 5 inches from door top to top of hinge.
  - 3. Center Hinge: Center between top and bottom hinge.
  - 4. Extra Hinge: 6 inches from bottom of top hinge to top of extra hinge.
- B. Lock: 38 inches from finished floor to center of lever or knob.
- C. Push Bar: 44 inches from bottom of door to center of bar.
- D. Push Plate: 44 inches from bottom of door to center of plate.
- E. Pull Plate: 42 inches from bottom of door to center of pull.
- F. Exit Device: 39-13/16 inches from finished floor to center of pad.
- G. Deadlock Strike: 44 inches from floor, centered.

3.04 ADJUSTING

- A. Adjust and check each operating item of hardware and each door to ensure proper operation or function of every unit. Replace units which cannot be adjusted to operate freely and smoothly.
- B. Inspection: Hardware supplier shall inspect all hardware furnished within 10 days of contractor's request and include with his guarantee a statement that this has been accomplished. Inspector or Contractor shall sign off the hardware as being complete and correctly installed and adjusted. Further corrections of defective material shall be the responsibility of his representative.

3.05 ADJUSTMENTS AND CLEANING

- A. At final completion, and when HVAC is operational and balanced, installer shall make final adjustment to and verify proper operation of all door closers and other hardware. Lubricate moving parts with type lubrication recommended by the manufacturer.
- B. All hardware shall be left clean and in good condition. Hardware found to be disfigured, defective or inoperative shall be repaired or replaced.

END OF SECTION 08 71 00



09 21 16  
GYPSUM WALLBOARD SYSTEMS

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Work Included: Gypsum Wallboard is required on all interior walls and ceiling surfaces in this work as indicated on the Drawings.

1.02 PRODUCT HANDLING

- A. Delivery and Handling:
  - 1. Deliver materials to the project site with manufacturer's labels intact and legible.
  - 2. Handle materials with care to prevent damage.
  - 3. Deliver fire-rated materials bearing testing agency label and required fire classification numbers.
- B. Storage:
  - 1. Store materials inside under cover, stack flat, off floor.
  - 2. Stack wallboard so that long lengths are not over short lengths.
  - 3. Avoid over-loading floor system.
  - 4. Store adhesives in dry area. Provide protection against freezing at all times.
- C. Protection: Use all means necessary to protect the materials of this section before, during and after installation, and to protect the installed work of other trades.
- D. 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.

1.03 QUALITY ASSURANCE

- A. Use only qualified journeymen. In the acceptance or rejection of installed gypsum wallboard, no allowance will be made for lack of skill on the part of the drywall Subcontractor.
- B. Where fire-resistive gypsum wallboard assemblies are required, adhere to assemblies and guidelines as published by the Gypsum Association in the current edition of the Gypsum Association's Fire Resistance Design Manual.

1.04 REFERENCES/STANDARDS

- A. ASTM C36 -Gypsum Wallboard
- B. ASTM C79 -Gypsum Sheathing Board
- C. ASTM C442 -Gypsum Backing Board and Core Board
- D. ASTM C514 - Nails for the Application of Gypsum Wallboard
- E. ASTM C645 - Non-Load (Axial) Bearing Steel Studs, Runners (Track) and Rigid Furring Channels for Screw Application of Gypsum Board
- F. ASTM C754 - Installation of Framing Members to Receive Screw Attached Gypsum Wallboard, Backing Board or Water Resistant Backing Board
- G. ASTM C840 - Application and Finishing of Gypsum Board
- H. ASTM C1002 - Steel Drill Screws for the Application of Gypsum Board
- I. ASTM E119 - Fire Tests of Building Construction and Materials
- J. GA-201 - Gypsum Board for Walls and Ceilings
- K. GA-216 - Recommended Specifications for the Application and Finishing of Gypsum Board
- L. GA-600 - Fire Resistance Design Manual

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GYPSUM WALLBOARD SYSTEMS

1.05 JOB CONDITIONS

A. Environmental Conditions:

1. Temperature: During cold weather, in areas receiving wallboard installation, maintain temperature storage between 55 degrees F. to 70 degrees F. (13 degrees C. to 21 degrees C.) for 24 hours before, during, and after gypsum wallboard and joint treatment application.
2. Ventilation:
  - a. Provide ventilation during and following adhesives and joint treatment application.
  - b. Protect installed materials from drafts during hot, dry weather.

B. Protection: Protect adjacent surfaces against damage and stains.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Gypsum Wallboard

1. Water resistant board shall be in thicknesses and locations as indicated on the drawings.
2. Regular board shall be in thickness as indicated on the drawings.

B. Concrete GFR wallboard

1. All surfaces to receive ceramic tile finish shall be covered with 7/16" concrete glass-fiber-reinforced wallboard.

C. Fasteners:

1. Gypsum wallboard screws
2. Screw length for wood or metal stud application:
  - a. Single layer 5/8" wallboard application: 1 5/8", Bugle head screw.

D. Grillage:

1. Running Channels: 1 1/2" cold rolled galvanized steel.
2. Cross furring channels: 3/4" cold rolled galvanized steel.
3. Hangers: Minimum of No. 12 gauge galvanized annealed wire.
4. Note: Gypsum wallboard lath suspension system 650 by Chicago Metallic Corporation is an acceptable equal.

E. Accessories:

1. Drywall Reveal Molding: Style WOM-625-75 by Fry Reglet Corporation.
2. Surface-Mounted Corner Guard: Type CGS-3 by Balco, Inc.
3. Color to be selected by Architect.

PART 3 – EXECUTION

3.01 INSPECTION

- A. Check framing for accurate spacing and alignment.
- B. Verify that spacing of installed framing does not exceed maximum allowable of thickness of wallboard to be used.
- C. Verify that door frames are set for thickness of wallboard to be used.

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GYP SUM WALLBOARD SYSTEMS

- D. Do not proceed with installation of wallboard until deficiencies are corrected and surfaces to receive wallboard are acceptable.

3.02 APPLICATION

A. General:

1. Use wallboard of maximum lengths to minimize end joints.
2. Stagger end joints when they occur.
3. Locate end joints as far as possible from center of wall or ceiling.
4. Abut wallboards without forcing.
5. Neatly fit ends and edges of wallboard.
6. Support ends and edges of wallboard panels on framing or furring members.
7. Follow manufacturer's installation recommendations.
8. Stagger vertical joints on opposite side of partition to occur on different
9. Place all board so that all joints occur at center of studs or furring channels.
10. Make all joints tight and accurate, keeping adjacent boards in flush planes.
11. Cut and fit boards neatly and accurately around electrical boxes, light fixtures, grilles, registers, diffusers, and similar items so that evidence of cutting and fitting will be concealed by cover plates, flanges, or trim.
12. Seal cut edges where such cuts occur in water-resistant board according to the manufacturer's recommendations.
13. Where full height walls and walls containing acoustic or thermal insulation are indicated on the drawings, install sealant at the perimeter of such gypsum drywall surfaces and around all items protruding through such surfaces. Refer to Section 09260, Acoustical Treatment for Partitions/Ceilings, for specific information.
14. Provide control joints in continuous runs of wall exceeding 30'-0" (vertical or horizontal). Coordinate the location of all control joints with the Architect prior to installation.
15. Provide control joints at all locations where secured to structural steel to provide isolation from wallboard secured to partition framing.

B. Single Layer Application:

1. Vertical surfaces: Space screws a maximum 8" o.c. in field of panel and 8" o.c. along vertical abutting edges. Stagger screws on abutting edges or ends.
2. Horizontal surfaces: Space screws maximum 6" o.c. in field of panel and 6" o.c. along abutting end joints. Stagger screws on abutting edges or ends.

C. Joint System

1. Prefill:
  - a. Fill "V" grooves formed by abutting rounded edges of wallboard with prefill joint compound.
  - b. Fill "B" joint flush and remove excess compound beyond groove.
  - c. Leave clear depression to receive tape.
  - d. Permit prefill joint compound to harden prior to application of tape.

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GYPSUM WALLBOARD SYSTEMS

2. Taping and finishing joints:
    - a. Taping or embedding joints:
      - 1) Apply compound in thin uniform layer to all joints and edges to be reinforced.
      - 2) Apply reinforcing tape immediately.
      - 3) Center tape over joint, and seat tape into compound.
      - 4) Leave approximately 1/64" (0.05mm) to 1/32" (.1mm) compound under tape to provide bond.
      - 5) Apply skim coat immediately following tape embedment, but not to function as fill or second coat.
      - 6) Fold tape and embed in angles to provide true angle.
      - 7) Dry embedding coat prior to application of fill coat.
    - b. Filling:
      - 1) Apply joint compound over embedding coat.
      - 2) Fill taper flush with surface.
      - 3) Apply fill coat to cover tape.
      - 4) Feather out fill coat beyond tape and previous joint compound line.
      - 5) Do not apply fill coat on interior angles.
      - 6) Allow fill coat to dry prior to application of finish coat.
    - c. Finishing:
      - 1) Spread joint compound evenly over and beyond fill coat on all joints.
      - 2) Feather to smooth uniform finish.
      - 3) Apply finish coat to taped angles to cover tape and taping compound.
      - 4) Sand final application of compound to provide surface ready for decoration.
  3. Filling and finishing depressions:
    - a. Apply joint compound as first coat to fastener depressions.
    - b. Apply at least two additional coats of compound after first coat is dry.
    - c. Leave filled and finished depressions level with plane of surface.
  4. Finished beads and trim:
    - a. First fill coat:
      - 1) Apply joint compound to bead and trim.
      - 2) Feather out from ground to plane of the surface.
      - 3) Dry compound prior to application of second fill coat.
    - b. Second fill coat:
      - 1) Apply joint compound in same manner as first fill coat.
      - 2) Extend beyond first coat onto face of wallboard.
      - 3) Dry compound prior to application of finish coat.
    - c. Finish coat:
      - 1) Apply joint compound to bead and trim.
      - 2) Extend beyond second fill coat.
- D. Metal Trim:
1. The drawings do not propose to show all metal trim required; verify with the Architect the precise locations and types of trim to be used.

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GYPSUM WALLBOARD SYSTEMS

2. Provide metal trim at all junctures of gypsum wallboard and dissimilar materials.
  3. Carefully inspect the drawings and verify location of all metal trim required.
  4. Install all trim in strict accordance with the manufacturer's recommendations, paying particular attention to make all trim installation plumb, level, and true-to-line with firm attachment to supporting members.
- E. Grillages: Spacing of furring channels and runner channels, and the spacing and spans of runners shall not exceed the limits given for each shape in the "Metal Lath Association Specifications".
1. Running channels shall be spaced not over 3 feet on center and spans shall not exceed 4 feet (2 feet at light fixtures).
  2. Suspend running channels directly from structure with 12 gauge hanger wire.
  3. Cross furring channels shall be spaced not over 13-1/2" on center.
  4. Hangers shall be spaced as specified above and within 6" of the ends of main runner runs and of boundary walls, girders, or similar interruptions of ceiling continuity. Main runner shall be properly positioned and leveled, and hangers shall be saddle tied along runner. Main runners shall not be let into nor come in contact with abutting masonry walls. Runner channels shall be located within 6" of the walls to channels shall be securely saddle tied with two strands of 16 gauge tie wire to main runners and shall not be let into or come in contact with abutting masonry walls. All openings shall be formed with carrying channels. All offsets and isolated areas shall be securely braced against sway.
- 3.03 ADJUST AND REPAIR
- A. "Nail Pop":
1. When face paper is punctured, drive new screw approximately 1-1/2" (38mm) from defective fastening and remove defective fastening.
  2. Fill damaged surface with compound.
- B. Ridging:
1. Do not repair ridging until condition has fully developed - approximately 6 months after installation or one heating season.
  2. Sand ridges to reinforcing tape without cutting through tape.
  3. Fill concave areas on both sides of ridge with topping compound.
  4. After fill is dry, blend in topping compound over repaired area.
- C. Cracks:
1. Fill cracks with compound and finish smooth and flush.

END OF SECTION 09 21 16

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GYPSUM WALLBOARD SYSTEMS

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SUSPENDED ACOUSTICAL CEILINGS

PART 1 -GENERAL

1.01 SECTION INCLUDES

- A. Suspended metal grid ceiling system and perimeter trim.
- B. Acoustical tile and panels.
- C. Non-fire rated assembly.
- D. Supplementary acoustical insulation over system units.

1.02 REFERENCES

- A. ASTM C635 - Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings.
- B. ASTM C636 - Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels.
- C. ASTM E580 - Practice for Application of Ceiling Suspended Systems for Acoustical Tile and Lay-in panels in areas requiring seismic restraint.
- D. ASTM E1264 - Classification of Acoustical Ceiling Products.
- E. Ceilings and Interior Systems Contractors Association (CISCA) - Acoustical Ceilings: Use and Practice.

1.03 SUBMITTALS

- A. Submit under provisions of Section 01 32 00.
- B. Shop Drawings: Indicate grid layout and related dimensioning, junctions with other work or ceiling finished, interrelation of mechanical and electrical items related to system and wall layouts.
- C. Product Data: Provide data on metal grid system components, acoustical units and accessories.
- D. Samples: Submit two samples full size illustrating material and finish of acoustical units.
- E. Samples: Submit two samples each, 12 inches (300 mm) long, of suspension system main runner, cross runner, edge trim, and hold down clips.
- F. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention.

1.04 QUALIFICATIONS

- A. Grid Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.
- B. Acoustical Unit Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.

1.05 REGULATORY REQUIREMENTS

- A. Conform to applicable code for combustibility requirements for materials.

1.06 ENVIRONMENTAL REQUIREMENTS

- A. Maintain uniform temperature of minimum 60 degrees F (16 degrees C), and maximum humidity of 40 percent prior to, during, and after acoustical unit installation.

1.07 SEQUENCING

- A. Sequence work to ensure acoustical ceilings are not installed until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.
- B. Install acoustical units after interior wet work is dry.

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SUSPENDED ACOUSTICAL CEILINGS

1.08 EXTRA MATERIALS

- A. Furnish under provisions of Section 01 77 00.
- B. Provide 10 percent of total acoustical unit area of extra tile panels to Owner.

PART 2 – PRODUCTS

2.01 MANUFACTURERS - SUSPENSION SYSTEM

- A. Chicago Metallic Corp.
- B. Armstrong Contract Interiors.
- C. Donn by U.S.G. Interiors, Inc.

2.02 SUSPENSION SYSTEM MATERIALS

- A. Non-fire Rated Grid: ASTM C635, heavy duty; exposed T as indicated: components die cut and interlocking.
- B. Grid Materials: Commercial quality cold rolled steel with galvanized coating.
- C. Exposed Grid Surface Width: 15/16 inch (24 mm).
- D. Grid Finish: White and color as indicated.
- E. Accessories: Stabilizer bars clips splices edge moldings hold down clips and for suspended grid system.
- F. Support Channels and Hangers: Galvanized steel; size and type to suit application, seismic requirements, a ceiling system flatness requirement specified.

2.03 MANUFACTURERS - ACOUSTICAL UNITS

- A. U.S.G. Interiors, Inc. Product as schedule.
- B. Armstrong Contract Interiors Product as scheduled.
- C. Celotex Building Products Product as scheduled.

2.04 ACOUSTICAL UNIT MATERIALS

- A. Armstrong Type 737
  - 1. Recessed Angular Tegular
  - 2. Size: 24" x 24" x 5/8"
  - 3. Grid: 15/16" DX
  - 4. Color: White

2.05 ACCESSORIES

- A. Touch-up Paint: Type and color to match acoustical and grid units.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Verify site conditions.
- B. Verify that layout of hangers will not interfere with other work.

3.02 INSTALLATION - LAY IN GRID SUSPENSION SYSTEM

- A. Install suspension system in accordance with manufacturer's instructions and as supplemented in this section.
- B. Install system in accordance with ASTM E580.



SUSPENDED ACOUSTICAL CEILINGS

- C. Install system capable of supporting imposed loads to a deflection of 1/240 maximum.
- D. Lay out system as indicated on reflected ceiling plans.
- E. Supply hangers or inserts for installation with instructions for their correct placement.
- F. Install after major above ceiling work is complete. Coordinate the location of hangers with other work.
- G. Provide hanger clips during steel deck erection. Provide additional hangers and inserts as required.
- H. Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.
- I. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels to span the extra distance.
- J. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability. Support fixture loads by supplementary hangers located within 6 inches (150 mm) of each corner; and support components independently.
- K. Do not eccentrically load system, or produce rotation of runners.
- L. Install edge molding at intersection of ceiling and vertical surfaces, using longest practical lengths. Miter corners. Provide edge moldings at junctions with other interruptions.
- M. Form expansion joints as required. Maintain visual closure.

## 3.03 INSTALLATION - CONCEALED GRID SUSPENSION SYSTEM

- A. Install suspension system in accordance with manufacturer's instructions and as supplemented in this section.
- B. Install system in accordance with ASTM E580.
- C. Install system capable of supporting imposed loads to a deflection of 1/240 maximum.
- D. Lay out system to a balanced grid design as indicated on reflected ceiling plans and/or electrical lighting plans.
- E. Install after major above ceiling work is complete. Coordinate the location of hangers with other work.
- F. Supply hangers or inserts for installation with instructions for their correct placement.
- G. Provide hanger clips during steel deck erection. Provide additional hangers and inserts as required.
- H. Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.
- I. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels to span the extra distance.
- J. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability. Support fixture loads by supplementary hangers located with 6 inches (150 mm) of each corner; and support components independently.
- K. Do not eccentrically load system, or produce rotation of runners.
- L. Install edge molding at intersection of ceiling and vertical surfaces, using longest practical lengths. Miter corners. Provide edge moldings at junctions with other interruptions.
- M. Form expansion joints as required. Maintain visual closure.

09 51 13  
SUSPENDED ACOUSTICAL CEILINGS

3.04 INSTALLATION - ACOUSTICAL UNITS

- A. Install acoustical units in accordance with manufacturer's instructions.
- B. Fit acoustical units in place, free from damaged edges or other defects detrimental to appearance and function.
- C. Lay directional patterned units one way with pattern parallel to shortest room axis. Fit border trim neatly against abutting surfaces.
- D. Install units after above ceiling work is complete.
- E. Install acoustical units level, in uniform plane, and free from twist, warp and dents.
- F. Cut tile panels to fit irregular grid and perimeter edge trim. Field rabbett tile panel edge. Double cut and field paint exposed edges of tegular units.
- G. Where bullnose concrete block corners round obstructions occur, provide preformed closers to match edge molding.
- H. Lay acoustical insulation for a distance of 48 inches (1 200 mm) either side of acoustical partitions.
- I. Install hold-down clips to retain panels tight to grid system within 20 ft (6 m) of an exterior door.

3.05 ERECTION TOLERANCES

- A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet (3 mm in 3 m).
- B. Maximum Variation from Plumb Grid Members Caused by Eccentric Loads: 2 degrees.

END OF SECTION 09 51 13

09 65 13  
RESILIENT WALL BASE AND ACCESSORIES

PART 1 – GENERAL

1.01 SUMMARY

- A. This Section includes resilient wall base and flooring accessories.
- B. See Division 09 Sections "Resilient Tile Flooring".

1.02 SUBMITTALS

- A. Product Data: For each product indicated.
- B. Below assumes manufacturer's standard-size Samples are acceptable. Revise to suit Project.
- C. Samples: For each product and for each color, pattern, and texture required.

1.03 PROJECT CONDITIONS

- A. Maintain a temperature of not less than 70 deg F (21 deg C) or more than 95 deg F (35 deg C) in spaces to receive resilient accessories for at least 48 hours before installation, during installation, and for at least 48 hours after installation, unless manufacturer's written recommendations specify longer time periods.
- B. After installation, maintain a temperature of not less than 55 deg F (13 deg C) or more than 95 deg F (35 deg C).
- C. Install resilient accessories after other finishing operations, including painting, have been completed.

1.04 EXTRA MATERIALS

- A. Extra materials may not be allowed for publicly funded projects.
- B. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents. Furnish not less than 10 linear feet (3 linear m) of each different type, color, pattern, and size of resilient product installed.

PART 2 – PRODUCTS

2.01 WALL BASE

- A. See "Listed Manufacturers" Article in the Evaluations for cautions about naming manufacturers and products.
- B. Retain above for nonproprietary or below for semiproprietary specification. Refer to Division 01 Section "Product Requirements."
- C. Products: Subject to compliance with requirements, provide one of the following:
  - 1. Armstrong World Industries, Inc.
  - 2. Roppe Corporation.
  - 3. Johnsonite, Division of Duramax, Inc.
  - 4. Others as approved equal.
- D. For proprietary or semiproprietary specification, delete descriptive wall base requirements below that are determined by product designations inserted above.
- E. Wall Base: Rubber, FS SS-W-40, Type I.
  - 1. Color and Pattern: As selected from manufacturer's full range.
  - 2. Style: Cove with top-set toe
  - 3. Minimum Thickness: 1/8 inch

RESILIENT WALL BASE AND ACCESSORIES

4. Height: 6 inches
5. Lengths: Coils in lengths standard with manufacturer, but not less than 96 feet
6. Outside Corners: Job formed.
7. Inside Corners: Job formed.
8. Surface: Smooth.

## 2.02 RESILIENT ACCESSORY MOLDING

- A. See "Listed Manufacturers" Article in the Evaluations for cautions about naming manufacturers and products.
- B. Retain above for nonproprietary or below for semiproprietary specification. Refer to Division 01 Section "Product Requirements."
- C. Products: Subject to compliance with requirements, provide one of the following:
  1. Johnsonite, Division of Duramax, Inc.
  2. Roppe Corporation.
  3. Others as approved equal.
- D. For proprietary or semiproprietary specification, delete descriptive requirements below that are determined by product designations inserted above.
- E. Description: Carpet edge for glue-down applications, reducer strip for resilient flooring.
  1. Material: Rubber.
  2. Color: As selected from manufacturer's full range.
  3. Profile and Dimensions: as required for application.

## 2.03 INSTALLATION ACCESSORIES

- A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement-based or blended hydraulic cement-based formulation provided or approved by resilient product manufacturer for applications indicated.
- B. Adhesives: Water-resistant type recommended by manufacturer to suit resilient products and substrate conditions indicated.

## PART 3 – EXECUTION

## 3.01 INSTALLATION

- A. Before installing resilient wall base and accessories:
  1. Remove coatings, including curing compounds, and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.
  2. Move resilient products and installation accessories into spaces where they will be installed at least 48 hours before installation, unless longer conditioning periods are recommended in writing by manufacturer. Install products only after they are at the same temperature as the space where they are to be installed.
- B. Use trowelable leveling and patching compounds to fill cracks, holes, and depressions in substrates.
  1. Broom and vacuum clean substrates to be covered immediately before installing resilient products. After cleaning, examine substrates for moisture, alkaline salts, carbonation, or dust. Proceed with installation only after unsatisfactory conditions have been corrected.

RESILIENT WALL BASE AND ACCESSORIES

2. Adhesively install resilient wall base and accessories. Place resilient products so they are butted to adjacent materials.
3. Apply resilient wall base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.
4. Install wall base in lengths as long as practicable without gaps at seams and with tops of adjacent pieces aligned.
5. Tightly adhere wall base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.
6. Do not stretch base during installation.
7. On masonry surfaces or other similar irregular substrates, fill voids along top edge of resilient wall base with manufacturer's recommended adhesive filler material.
8. Form outside corners on job, from straight pieces of maximum lengths possible, without whitening at bends. Shave back of base at points where bends occur and remove strips perpendicular to length of base that are only deep enough to produce a snug fit without removing more than half the wall base thickness.
9. Form inside corners on job, from straight pieces of maximum lengths possible, by cutting an inverted V-shaped notch in toe of wall base at the point where corner is formed. Shave back of base where necessary to produce a snug fit to substrate.
10. Install reducer strips at edges of flooring that otherwise would leave exposed edges.
  - a. At doors, install reducer strips to be hidden by the closed door.
11. Immediately after installing resilient products, remove adhesive and other surface blemishes using cleaner recommended by resilient product manufacturers.

END OF SECTION 09 65 13

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RESILIENT WALL BASE AND ACCESSORIES

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VINYL LUXURY TILE-18x18 TILE

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Flooring and accessories as shown on the drawings and schedules and as indicated by the requirements of this section.

B. Related Documents

1. Drawings and General Provisions of the Contract (including General and Supplementary Conditions and Division 1 sections) apply to the work of this section.

C. Related Sections:

1. Other Division 9 sections for floor finishes related to this section but not the work of this section
2. Division 3 Concrete; not the work of this section
3. Division 6 Wood and Plastics; not the work of this section
4. Division 7 Thermal and Moisture Protection; not the work of this section

1.02 REFERENCES

A. Armstrong Flooring Technical Manuals

B. ASTM International:

1. ASTM E 648 Standard Test Method for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source
2. ASTM E 662 Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials
3. ASTM F 710 Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring
4. ASTM F 1482, Standard Guide to Wood Underlayment Products Available for Use Under Resilient Flooring
5. ASTM F 1700 Standard Specification for Solid Vinyl Tile
6. ASTM F 1861 Standard Specification for Resilient Wall Base
7. ASTM F 1869 Standard Test Method for Measuring Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride
8. ASTM F 2170 Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes

1.03 SYSTEM DESCRIPTION

A. Performance Requirements: Provide flooring which has been manufactured, fabricated, and installed to performance criteria certified by manufacturer without defects, damage, or failure.

B. Administrative Requirements

1. Pre-installation Meeting: Conduct an on-site pre-installation meeting to verify project requirements, substrate conditions, manufacturer's installation instructions and manufacturer's warranty requirements. Comply with Division 1 Project Management and Coordination (Project Meetings) Section.
2. Pre-installation Testing: Conduct pre-installation testing as follows: [Specify testing (i.e., moisture tests, bond test, pH test, etc.).]

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VINYL LUXURY TILE-18x18 TILE

C. Sequencing and Scheduling

1. Install flooring and accessories after the other finishing operations, including painting, have been completed. Close spaces to traffic during the installation of the flooring.
2. Do not install flooring over concrete slabs until they are sufficiently dry to achieve a bond with the adhesive, in accordance with the manufacturer's recommended bond, moisture tests and pH test.

1.04 SUBMITTALS

- A. Submit shop drawings, seaming plan, coving details, and manufacturer's technical data, installation, and maintenance instructions.
- B. Submit the manufacturer's standard samples showing the required colors for flooring and applicable accessories.
- C. Submit Safety Data Sheets (SDS) available for adhesives, moisture mitigation systems, primers, patching/leveling compounds, floor finishes (polishes) and cleaning agents and Material Information Sheets for flooring products.
- D. If required, submit the manufacturer's certification that the flooring has been tested by an independent laboratory and complies with the required fire tests.
- E. Closeout Submittals: Submit the following:
  1. Operation and Maintenance Data: Operation and maintenance data for installed products in accordance with Division 1 Closeout Submittals (Maintenance Data and Operation Data) Section. Include methods for maintaining installed products, and precautions against cleaning materials and methods detrimental to finishes and performance.
  2. Warranty: Warranty documents specified herein.

1.05 QUALITY ASSURANCE

- A. Single-Source Responsibility: provide types of flooring and accessories supplied by one manufacturer, including moisture mitigation systems, primers, leveling and patching compounds, and adhesives.
- B. Select an installer who is experienced and competent in the installation of Armstrong resilient solid vinyl tile flooring and the use of Armstrong Flooring subfloor preparation products.
  1. Engage installers certified as Armstrong Commercial Flooring Certified Installers
  2. Confirm installer's certification by requesting their credentials
- C. Fire Performance Characteristics: Provide resilient tile flooring with the following fire performance characteristics as determined by testing material in accordance with ASTM test methods indicated below by a certified testing laboratory or other testing agency acceptable to authorities having jurisdiction:
  1. ASTM E 648 (NFPA 253) Critical Radiant Flux of 0.45 watts per sq. cm. or greater, Class I
  2. ASTM E 662 (NFPA 258) (Smoke Generation) Maximum Specific Optical Density of 450 or less
  3. CAN/ULC-S102.2 – Flame Spread Rating and Smoke Developed – Results as tested

1.06 DELIVERY, STORAGE AND HANDLING

- A. Comply with Division 1 Product Requirements Sections.
- B. Comply with manufacturer's ordering instructions and lead time requirements to avoid construction delays.



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- C. Deliver materials in good condition to the jobsite in the manufacturer's original unopened containers that bear the name and brand of the manufacturer, project identification, and shipping and handling instructions.
- D. Store materials in a clean, dry, enclosed space off the ground, protected from harmful weather conditions and at temperature and humidity conditions recommended by the manufacturer. Protect adhesives from freezing. Store flooring, adhesives, and accessories in the spaces where they will be installed for at least 48 hours before beginning installation.

1.07 PROJECT CONDITIONS

- A. Maintain a minimum temperature in the spaces to receive the flooring and accessories of 65°F (18°C) and a maximum temperature of 85°F (29°C) for at least 48 hours before, during, and for not less than 48 hours after installation. Thereafter, maintain a minimum temperature of 55°F (13°C) in areas where work is completed. Protect all materials from the direct flow of heat from hot-air registers, radiators, or other heating fixtures and appliances.

1.08 LIMITED WARRANTY

- A. Resilient Flooring: Submit a written warranty executed by the manufacturer, agreeing to repair or replace resilient flooring that fails within the warranty period.
- B. Limited 15-Year Commercial Warranty
- C. Limited 15-Year Quantum Guard Elite® Wear Warranty

1.09 MAINTENANCE

- A. Extra Materials: Deliver extra materials to Owner. Furnish extra materials from same production run as products installed. Packaged with protective covering for storage and identified with appropriate labels.
  - 1. Quantity: Furnish quantity of flooring units equal to 5% of amount installed.
  - 2. Delivery, Storage and Protection: Comply with Owner's requirements for delivery, storage, and protection of extra material.

PART 2 - PRODUCTS

2.01 MANUFACTURER

- A. Resilient tile flooring, wall base, adhesives and subfloor preparation products and accessories:
  - 1. Mannington Commercial Spacia Collection Stone.
  - 2. All others must submit for prior approval

2.02 RESILIENT TILE FLOORING MATERIALS

- A. Provide Spacia Collection Stone manufactured by Mannington.
  - 1. Construction: Luxury Vinyl Tile Non-ortho Phthalate .
  - 2. Reference specification - ASTM F 1700, "Standard Specification for Solid Vinyl Tile", Class III, Type B
  - 3. Thickness: 0.098" (2.5 mm)
  - 4. Wear layer thickness: 0.020 mil. (0.51 mm)
  - 5. Wear Layer Quantum Guard Elite®
  - 6. Size: 18 in. x 18 in.
  - 7. Color as selected from the manufacturer's standard color chart

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B. Testing

1. HUD/FHA Passes
2. Flexibility (ASTM F137) Passes - 1" Mandrel - No Crack/Break
3. Dimensional Stability (ASTM F2199) Passes - Max 0.020 in/lin ft
4. Squareness (ASTM F540) Passes - Max 0.010"
5. Static Load (ASTM F970 mod.) Passes - 2,000 PSI; Residual Indent  $\leq$  0.005"
6. Residual Indentation (ASTM F1914) Passes -  $<$  8% Avg / 10% Single Value
7. Flooring Radiant Panel (ASTM E648) Passes - Class 1;  $\geq$  0.45 watts/cm<sup>2</sup>
8. Smoke Density (ASTM E662) Passes -  $\leq$  450
9. Slip Resistance (ASTM C1028) Passes -  $\geq$  0.5 Leather; 0.6 Rubber
10. Resistance to Light (ASTM F1515) Passes
11. Chemical Resistance (ASTM F925) Passes
12. Resistance to Heat (ASTM F1514) Passes

2.03 WALL BASE MATERIALS

- A. For top set wall base: [Provide 1/8 in. (3.18 mm) thick, 4 in. (10.16 cm) high Armstrong Flooring Wall Base with a matte finish, conforming to ASTM F 1861, Type TP - Rubber, Thermoplastic, Group 1 - Solid, Style B – Cove.] [Provide 1/4 in. (6.35 mm) thick, 4.5 in. (11.43 cm) high Armstrong Flooring Color-Integrated Wall Base with a matte finish, conforming to ASTM F 1861, Type TP - Rubber, Thermoplastic, Group 1 - Solid, Style A – Straight.
- B. Color as selected from manufacturer's standard color chart.

2.04 ADHESIVES

- A. Provide Adhesive as recommended by the flooring manufacturer
- B. Provide Adhesive as recommended by the wall base manufacturer.

2.05 ACCESSORIES

- A. For patching, smoothing, and leveling monolithic subfloors (concrete, terrazzo, quarry tile, ceramic tile, and certain metals), provide Armstrong [S-194 Cement-Based Patch, Underlayment and Embossing Leveler / S-195 Underlayment Additive] [S-463 Level Strong™ cement based self-leveling compound] [S-466 Patch Strong™ flexible patching and smoothing compound].
- B. [For priming porous substrates to aid in adhesive bond strength and reducing subfloor porosity, provide S-464 Prime Strong™ acrylic primer for porous substrates. For non-porous substrates, provide S-465 NP Prime Strong™ acrylic primer for non-porous substrates].
- C. [For creating a moisture barrier, provide S-462 Seal Strong™ two-part moisture mitigation system].
- D. For sealing joints between the top of wall base or integral cove cap and irregular wall surfaces such as masonry, provide plastic filler applied according to the manufacturer's recommendations.
- E. Provide transition/reducing strips tapered to meet abutting materials.
- F. Provide threshold of thickness and width as shown on the drawings.
- G. Provide resilient edge strips of width shown on the drawings, of equal gauge to the flooring, homogeneous vinyl, or rubber composition, tapered or bullnose edge, with color to match or contrast with the flooring, or as selected by the Architect from standard colors available.

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- H. Provide metal edge strips of width shown on the drawings and of required thickness to protect exposed edges of the flooring. Provide units of maximum available length to minimize the number of joints. Use butt-type metal edge strips for concealed anchorage or overlap-type metal edge strips for exposed anchorage. Unless otherwise shown, provide strips made of extruded aluminum with a mill finish.

PART 3 - EXECUTION

3.01 MANUFACTURER'S INSTRUCTIONS

- A. Compliance: Comply with manufacturer's product data, including technical bulletins, product catalog, installation instructions, and product carton instructions for installation and maintenance procedures as needed.

3.02 EXAMINATION

- A. Site Verification of Conditions: Verify substrate conditions (which have been previously installed under other sections) are acceptable for product installation in accordance with manufacturer's instructions (i.e., moisture tests, bond test, pH test, etc.).
- B. Visually inspect flooring materials, adhesives, and accessories prior to installation. Flooring material with visual defects shall not be installed and shall not be considered as a legitimate claim.
- C. Examine subfloors prior to installation to determine that surfaces are smooth and free from cracks, holes, ridges, and other defects that might prevent adhesive bond or impair durability or appearance of the flooring material.
- D. Inspect subfloors prior to installation to determine that surfaces are free from curing, sealing, parting and hardening compounds; residual adhesives; adhesive removers; and other foreign materials that might prevent adhesive bond. Visually inspect for evidence of moisture, alkaline salts, carbonation, dusting, mold, or mildew.
- E. Report conditions contrary to contract requirements that would prevent a proper installation. Do not proceed with the installation until unsatisfactory conditions have been corrected.
- F. Failure to call attention to defects or imperfections will be construed as acceptance and approval of the subfloor. Installation indicates acceptance of substrates with regard to conditions existing at the time of installation.

3.03 PREPARATION

- A. Contact Mannington Commercial Technical Services for guidance about subfloor testing and installation recommendations.
- B. Technical Services can be reached Monday to Friday, 8:00 a.m. to 5:00 p.m. EST at 800-241-2262 extension 3.

3.04 INSTALLATION OF FLOORING

- A. Install flooring in strict accordance with instructions provided at [https://mannington.widen.net/view/pdf/gaah50xuv/LVT\\_Installation\\_Direct.pdf?t.download=true&u=sdhomb](https://mannington.widen.net/view/pdf/gaah50xuv/LVT_Installation_Direct.pdf?t.download=true&u=sdhomb).
- B. Failure to comply may result in voiding the manufacturer's warranty listed in Section 1.08.
- C. Install flooring wall to wall before the installation of floor-set cabinets, casework, furniture, equipment, movable partitions, etc. Extend flooring into toe spaces, door recesses, closets, and similar openings as shown on the drawings.

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VINYL LUXURY TILE-18x18 TILE

3.05 INSTALLATION PROCEDURES

- A. Acclimation: The installation and materials to be installed shall be maintained at a minimum of 65°F (18.3°C) and a maximum of 85° F (29.4°C) for 48 hours before, during and for 48 hours after completion of the installation, and continue to maintain the flooring at a temperature between 55°F - 85° F during its service life.
- B. Relative humidity level extremes should also be avoided. General recommended humidity control level is between 30-60%. If a system other than the permanent HVAC source is utilized, it must provide proper control of both temperature and humidity to recommended or specific levels for the appropriate time duration.
- C. Sequence: The most uniform installation will be obtained by sequencing the pallet numbers in the order they were manufactured. starting with the lowest number and progress to higher numbers. Each pallet should have tile cartons with a similar range of numbers.
- D. Flooring materials: Check that the quantity of Mannington Commercial LVT and adhesive are sufficient for area to be installed. Check material for visual defects before installation. Installation of flooring acknowledges acceptance of materials. Report discrepancies immediately to Mannington Commercial at 800.241.2262 ext. 2 (Claims), as installation of products installed with visual defects, mixed production runs or incorrect style will not be honored.
- E. Expansion joints, isolation joints or other moving joints are incorporated into concrete floor slabs in order to permit movement without causing random cracks in the concrete. These joints must be honored and not filled with underlayment products or other materials, and floor coverings must not be laid over them. Expansion joint covering systems should be detailed by the architect or engineer based upon intended usage and aesthetic considerations.
- F. Surface cracks, grooves, depressions, control joints or other non-moving joints, and other irregularities shall be filled or smoothed with high quality Portland cement-based patching or underlayment compound for filling or smoothing or both. Patching or underlayment compound shall be moisture, mildew, and alkali-resistant, and shall provide a minimum of 3500 psi compressive strength after 28 days, when tested in accordance with ASTM C109 or ASTM C472, whichever is appropriate.
- G. Subfloor preparation: Make sure all surfaces to be covered are completely clean, dry and smooth and that a necessary subfloor preparation has been properly completed and documented.
- H. Inspect substrate: Perform final acceptance inspection of substrate.
- I. Adjacent surfaces protection: Protect adjacent work areas and finish surfaces from damage during product installation.
- J. Flooring protection: Mannington Commercial LVT should be the last material installed to prevent other trades from disrupting the installation and adhesive set-up or damaging the floor.

3.06 INSTALLATION OF ACCESSORIES

- A. Apply top set wall base to walls, columns, casework, and other permanent fixtures in areas where top-set base is required. Install base in lengths if practical, with inside corners fabricated from base materials that are mitered or coped. Tightly bond base to vertical substrate with continuous contact at horizontal and vertical surfaces.
- B. Fill voids with plastic filler along the top edge of the resilient wall base or integral cove cap on masonry surfaces or other similar irregular substrates.
- C. Place resilient edge strips tightly butted to flooring, and secure with adhesive recommended by the edge strip manufacturer. Install edge strips at edges of flooring that would otherwise be exposed.

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VINYL LUXURY TILE-18x18 TILE

- D. Apply metal edge strips where shown on the drawings, after flooring installation. Secure units to the substrate, complying with the edge strip manufacturer's recommendations.

3.07 CLEANING

- A. Perform initial and on-going maintenance according to the latest edition of the maintenance recommendations for Mannington Commercial Spacia Collection Stone.

3.08 PROTECTION

- A. Protect installed flooring as recommended by the flooring manufacturer against damage from rolling loads, other trades, or the placement of fixtures and furnishings.

END OF SECTION 09 65 19.24

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VINYL LUXURY TILE-18x18 TILE

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GENERAL PAINTING AND FINISHING REQUIREMENTS

## PART 1 – GENERAL

## 1.01 DESCRIPTION

## A. Work Includes But Not Limited To-

1. Finishing elements of the building shown on attached Finish Schedule or specified below.
2. Back prime work to be installed against concrete or masonry or subjected to moisture.
3. Paint mechanical and electrical items located in classrooms as determined by Owner.

## B. The type of material to be used and the number of coats to be applied are listed in the Part 2 of this Section or as noted on the Drawings.

## C. Prepare and paint or finish surfaces as hereinafter described, including, but not limited to the following:

1. Concrete Unit Masonry
2. Gypsum plaster
3. Cement plaster
4. Wood doors, finish wood carpentry, and trim
5. Hollow metal doors, frames

## D. Other exposed surfaces that are not specifically indicated to be factory finished or finished by others.

## E. It is the intent of this Specification to require all existing painted wall surfaces, except those explicitly exempted herein, to be painted under this contract.

## F. Related Documents-

1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Section in Division 01, General Requirements, of these Specifications.

## 1.02 SUBMITTALS

## A. Product Data-

1. Written list of specific products proposed along with Manufacturer's certification that products meet specified requirements. Before any paint materials are delivered to the job site, submit to the Architect in accordance with the provisions of Section 01 32 00 of these specifications a complete list of all materials proposed to be furnished and installed under this portion of the work.

- a. Data shall be specific as to Manufacturer's brand name and identifying numbers.
- b. Samples: Accompanying the materials list, submit to the Architect two copies of the full range colors available in each of the proposed products.
- c. Indicate square footage to be covered by each product, Manufacturer's recommended coverage rates, and amount of product required based on average coverage.
- d. Indicate items to be finished as work of each painting Section.
- e. Outline, preparation and application procedures to be followed including application methods, time between coats, and environment
- f. Provide Manufacturer's cut sheets which indicate paint components. As a minimum, specification requirements for paint composition shall be given on cut sheets submitted.

2. Color selection data.
3. Maintenance instructions.

GENERAL PAINTING AND FINISHING REQUIREMENTS

## B. Samples-

1. Provide paint card for each color and for each paint system. Card to show each component of system as well as total system.

## 1.03 QUALITY ASSURANCE

## A. Pre-installation Meeting-

1. Schedule meeting after delivery of paint but prior to application of field samples or paint.

## B. Field Samples-

1. Prior to application of any paint system meet on Project site with Owner's representative. Owner may select one surface for application of each paint system specified.
2. Apply paint systems to surfaces indicated following procedures outlined in Contract Documents and Product Data submission specified above.
3. After approval of samples, proceed with application of paint system throughout Project.

## C. Applicator shall have experience in application of specified products for five years minimum and be acceptable to Owner and Manufacturer.

## 1.04 DELIVERY, STORAGE, &amp; HANDLING

## A. Deliver specified products in original containers with labels intact on each container. Deliver amount of material indicated on submittal for Project in single shipment. Notify Owner two working days prior to delivery.

## B. Store materials in single place.

## C. Keep storage area clean and rectify any damage to area at completion of work of this Section.

## D. 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.

## 1.05 PROJECT/SITE CONDITIONS

## A. Environmental Conditions-

1. Maintain temperature of paint storage area at 55 deg. F minimum.
2. Perform painting operations at temperature conditions recommended by Manufacturer for each operation.

## 1.06 SCHEDULING

## A. Coordinate by room painting schedules with Owner.

## B. Examine Contract Documents for painting requirements of other trades. Become familiar with their painting provisions and the painting of finish surfaces left unfinished by the requirements of other Sections.

## C. Contractor may work in facilities during normal hours of 6 a.m. to 6 p.m., or with approval of Owner after 6 p.m.

## 1.07 MAINTENANCE

## A. Extra Materials-

1. Provide one gallon of each finish coat material in Manufacturer's original container in each color used. Provide one gallon of each primer and of each undercoat in each color used.
2. The paint containers shall be clearly identified with the paint color number and name.



GENERAL PAINTING AND FINISHING REQUIREMENTS

## PART TWO – PRODUCTS

## 2.01 MATERIALS

## A. Manufacturer

1. All paint materials selected for coating systems for each type of surface shall be the product of a single manufacturer.
2. Primers shall be by the same manufacturer as the paint used for the final coats and shall be of the type recommended by that manufacturer for the particular application.
3. Thinners, when used, shall be only those thinners recommended for that purpose by the manufacturer of the material to be thinned.

## B. Standards:

1. Sherwin-Williams
2. M.A.B.
3. Porter Paint
4. Devoe Paint

## C. Linseed oil, shellac, turpentine, and other painting materials shall be pure, of highest quality, and bear identifying labels on containers.

## D. Tinting color shall be best grade of type recommended by Manufacturer of paint or stain used on Project.

## E. Paint compositions shall not only meet specified requirements but also contain sufficient miscellaneous components to promote proper drying and performance during and after application.

## 2.02 GUIDE TO APPROVED PRODUCTS

## A. General: The following list of manufacturers and products is approved by the Architect for use on the project. Such a list shall serve as a guide to the quality of the types of materials to be used and shall not be construed as a basis for limiting competition.

## B. Materials list:

1. Metal Primer:
  - a. Sherwin-Williams - Kemk Kromik Metal Primer
  - b. Or equal
2. Metal Finish coat:
  - a. Sherwin-Williams - Pro-Mar Alkyd
  - b. Or equal
3. Latex Wall and Ceiling Primer:
  - a. Sherwin-Williams - Pro-Mar Latex Wall Primer
  - b. Or equal
4. Semi-Gloss Finish:
  - a. Sherwin-Williams - Style Perfect Latex Semi-Gloss Enamel
  - b. Or equal
5. Flat Finish:
  - a. Sherwin-Williams - Pro-Mar 400 Latex Wall
  - b. Or equal
6. Wood Varnish:
  - a. Sherwin-Williams - S-W Oil Base Gloss Varnish
  - b. Sherwin-Williams - S-W Oil Base Satin Finish
  - c. Or equal

GENERAL PAINTING AND FINISHING REQUIREMENTS

7. Wood Stain Interior:
    - a. Sherwin-Williams - S-W Interior Wood Stain
    - b. Or equal
  8. Paste Filler:
    - a. Sherwin-Williams - S-W Paste Wood Filler
    - b. Or equal
  9. Galvanized Metal Primer:
    - a. Sherwin-Williams - S-W Galvanized Iron Primer
    - b. Or equal
  10. Galvanized Metal Finish Coat:
    - a. Sherwin-Williams - Pro-Mar Alkyd Semi-Gloss Enamel
    - b. Or equal
- C. Finish color as Scheduled or selected by Owner

## PART THREE – EXECUTION

## 3.01 INSPECTION

- A. 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.
- B. Verify that paint finishes may be applied in strict accordance with all pertinent codes and regulations and the requirements of these specifications is complete to the point where this installation may properly commence.
- C. Prior to installation of work of this Section, inspect spaces to verify that spaces are ready for commencing painting.
- D. 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.
- E. If inspection reveals deficiencies in work areas such that painting cannot be successfully completed, for not proceed with work of this Section in area of deficiency until resolved.
- F. Starting painting work will be construed as acceptance of surfaces and conditions within any particular area.

## 3.02 PREPARATION OF SURFACES, GENERAL

- A. Protection: Prior to all surface preparation and painting operations, completely mask, remove, or otherwise adequately protect all hardware, accessories, machined surfaces, nameplates, U.L. labels lighting fixtures, and similar items in contact with painted surfaces but not scheduled to receive paint.
- B. Smoothing: Unless specifically noted to be left rough, smooth all finished wood surfaces exposed to view, using the proper sandpaper.
- C. Dryness: Unless specifically approved by the Architect, do not proceed with the painting of wood surfaces until the moisture content of the wood is 12% or less.
- D. Surfaces to be painted shall be clean and free of loose dirt. Clean and dust surfaces before painting or finishing.
- E. Do no exterior painting while surface is damp, unless recommended by Manufacturer, nor during rainy or frosty weather. Interior surfaces shall be dry before painting.
- F. Apply barrier coats over incompatible primers.

GENERAL PAINTING AND FINISHING REQUIREMENTS

- G. Remove hardware, electrical device covers, lighting fixtures, and similar in place work or provide surface applied protection prior to surface preparation and painting. After completion of painting, reinstall any removed work.
- H. Fill holes and cracks in surfaces to receive paint or stain.

## 3.03 PREPARATION OF METAL SURFACES

- A. Galvanized Metal:
  - 1. Clean all surfaces thoroughly with solvent until they are completely free from dirt, oil, and grease.
  - 2. Thoroughly treat the cleaned surface with phosphoric acid etch.
  - 3. Remove all excess etching solution and allow to dry completely before application of paint.
- B. Other Metals:
  - 1. Thoroughly clean all surfaces until they are completely free from rust, dirt, oil, and grease.
  - 2. Allow to dry thoroughly before application of paint.

## 3.04 PREPARATION OF GYPSUM DRYWALL

- A. Remove dirt, dust, and other foreign matter. Smooth all apparent deposits of spackling compound, taking care not to damage the paper cover of the gypsum drywall.

## 3.05 PREPARATION OF WOOD SURFACES

- A. Cleaning: Clean all wood surfaces until they are free from dirt, oil, and all other foreign substance.
- B. Knots:
  - 1. On small, dry, seasoned knots, thoroughly scrape and clean the surface and apply one coat of good quality knot-sealer before application of the priming coat.
  - 2. On large, open, unseasoned knots, scrape off all pitch and thoroughly clean the area, followed by an application of one coat of good quality knot-sealer.
  - 3. Remove and treat all pitch surface as required for large knots.
- C. Dryness: Unless specifically approved by the Architect, do not proceed with the painting of wood surfaces until the moisture content of the wood is 12% or less.

## 3.06 PREPARATION OF MASONRY SURFACES

- A. Cleaning: Cleaning all masonry surfaces until they are free from dirt, oil, and all other foreign substances.
- B. Spot prime existing masonry as required for complete coating.

## 3.07 PAINT APPLICATION

- A. General:
  - 1. Paint all surfaces except glass, copper, bronze, chromium plate, nickel, stainless steel, anodized aluminum, or monel metal except as explicitly specified.
  - 2. and similar items not finished and not called out for as unfinished.
  - 3. Paint all grilles and other pre-finished items where the factory finish is not in accordance with the "Painting Schedule".
  - 4. Carefully follow Specifications and color schedule, painting complete all surfaces to be painted.
  - 5. Spread materials smoothly and evenly.

GENERAL PAINTING AND FINISHING REQUIREMENTS

6. Putty nail holes in wood after application of first finish coat using natural colored type to match wood finish. Bring putty flush with adjoining surfaces.
  7. Finished work shall be uniform, of approved color, smooth, and free from runs, sags, defective brushing, rolling, clogging, and excessive flooding.
  8. Read color schedule for rooms before priming walls. Tint priming coat and undercoat to approximate shade of final coat, but with enough difference so it is possible to check application of specified number of coats.
  9. Touch up suction spots after application of first coat.
  10. Use fine sandpaper between coats as necessary to produce even, smooth surfaces.
  11. Paint shall be thoroughly dry and surfaces clean before applying succeeding coats.
  12. Make edges of paint adjoining other materials or colors clean, sharp, and without overlapping.
  13. All painting of mechanical piping shall be by the Mechanical Prime Contractor.
- B. Drying:
1. Allow sufficient drying time between coats.
  2. Modify the periods as recommended by the material manufacturer to suit adverse weather conditions.
  3. Oil-base and oleo-resinous solvent-type paints shall be considered dry for recoating when the paint feels firm, does not deform or feel sticky under moderate pressure of the thumb, and the application of another coat of paint does not cause lifting or loss of adhesion of the undercoat.
- C. Environmental Conditions:
1. Comply with the Manufacturers recommendations as to environmental conditions under which the coating systems may be applied.
  2. Do not apply paint in areas where dust is being generated.
- D. Moisture Content:
1. Use a moisture meter approved by the Architect to test surfaces.
  2. Do not apply the initial coating until moisture meter reading is within limits recommended by the paint materials manufacturer.
- E. Defects: Sand and dust between coats to remove all defects visible to the unaided eye from a distance of five feet.
- F. Color of undercoats: Slightly vary the color of succeeding coats.

**3.08 INSPECTION**

- A. General: Do not apply additional coat until completed coat has been inspected and approved by the Architect.
- B. Number of coats: Only inspected and approved coats of paint will be considered in determining the number of coats applied.

**3.09 ADJUSTMENT**

- A. At completion of Project, touch up work to match specified finish. Repaint are damaged during construction with specified finish at no additional cost to Owner.

**3.09 CLEANING UP**

- A. General:
  1. During progress of the work, do not allow the accumulation of empty containers or other excess items except in areas specifically set aside for that purpose.

GENERAL PAINTING AND FINISHING REQUIREMENTS

2. Remove all oily rags and waste from building each night. Take every precaution to avoid danger of fire.
  3. Prevent accidental spilling of paint materials and, in event of such spill, immediately remove all spilled material and the waste or other equipment used to clean up the spill, and wash the surfaces to their original undamaged condition, all at no additional cost to the Owner.
- B. Prior to final inspection: Upon completion of this portion of the work, visually inspect all surfaces and remove all paint and traces of paint from surfaces not scheduled to be painted.
- C. Upon completion of work of this Section, remove paint spots from floors, walls, glass, or other surfaces and leave work clean, orderly, and in acceptable condition. Remove debris caused by work of this Section from premises.

END OF SECTION 099010

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GENERAL PAINTING AND FINISHING REQUIREMENTS

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METAL TOILET COMPARTMENTS

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Metal toilet compartments, floor mounted.
- B. Urinal screens; wall mounted
- C. Shower Cubicles.

1.02 REFERENCES

- A. ANSI A117.1 - Safety Standards for the Handicapped.
- B. ASTM A167 - Stainless and Heat Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
- C. ASTM A424 - Steel Sheet for Porcelain Enameling.
- D. ASTM A526 - Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, Commercial Quality.
- E. FS RR-P-1352 - Partitions, Toilet Complete.
- F. Americans with Disabilities Act.

1.03 SUBMITTALS

- A. Submit under provisions of Section 01 32 00.
- B. Shop Drawings: Indicate partition plan, elevation views, dimensions, details of wall, floor, and ceiling supports, door swings.
- C. Product Data: Provide data on panel construction, hardware, and accessories.
- D. Samples: Submit two samples of partition panels, illustrating panel finish, color, and sheen.

1.04 REGULATORY REQUIREMENTS

- A. Conform to ANSI A117.1 Americans with Disabilities Act for access for the handicapped.

1.05 FIELD MEASUREMENTS

- A. Verify that field measurements are as indicated on shop drawings.

1.06 COORDINATION

- A. Coordinate the work with placement of support framing and anchors in wall.

PART 2 – PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Global Steel Products Corporation Product Embassy.
- B. Accurate Partitions Corporation Product Concord.
- C. Flush Metal Partition Corporation Product Flushlite.
- D. Metpar Corporation Product Corinthian.
- E. Sanymetal Product Academy.

2.02 MATERIALS

- A. As indicated on Drawings.

2.03 ACCESSORIES

- A. Pilaster Shoe: Formed ASTM A167 type 304 stainless steel with No. 4 finish, 3inch (175 mm) high, with adjustable screw jack.

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METAL TOILET COMPARTMENTS

- B. Head Rails: Hollow stainless steel tube, 1 x 1-5/8 inch (25 x 41 mm) size, with anti-grip strips and cast socket wall brackets.
- C. Attachments, Screws, and Bolts; Stainless steel; tamper proof type, heavy duty extruded aluminum brackets.
- D. Hardware: Chrome plated non-ferrous cast metal: stainless steel
  - 1. Pivot hinges, gravity type, adjustable for door close positioning.
  - 2. Nylon bearings.
  - 3. Thumb turn door latch with exterior emergency access feature.
  - 4. Door strike and keeper with rubber bumper.
  - 5. Coat hook with rubber bumper.
  - 6. Door pull for outswinging doors.

2.04 FABRICATION

- A. Fabricate partitions in accordance with FS RR-P-1352.
- B. Fabricate components of steel sheet as follows:
  - 1. Panel and Door Faces: 20 and 22 gage.
  - 2. Pilaster Faces: 18 and 20 gage.
  - 3. Reinforcement: 12 gage (2.5 mm).
- C. Doors and Panels:
  - 1. Thickness: 1 inch (25 mm)
  - 2. Door Width: 24 inch (610 mm)
  - 3. Door Width for Handicapped Use: 36 inch (915 mm), out-swinging.
  - 4. Height: 58 inch (1473 mm)
- D. Pilasters: 1-1/4 inch (32 mm) thick, of sizes required to suit cubicle width and spacing.
- E. Door, Panel, and Pilaster Construction: Sheet steel face, pressure bonded to sound deadening core, form and close edges, miter and weld corners, grind smooth.
- F. Internal Reinforcement: Provide in areas of attached hardware and fittings. Mark locations of reinforcement for partition mounted washroom accessories.

2.05 FINISHING

- A. Clean, degrease, and neutralize panels. Follow immediately with a phosphatizing treatment, prime coat and powder coat finish.
- B. Single Color: Color as selected by the Owner from standard Manufacturer's color chart.
- C. Stainless Steel Surfaces: No. 4 finish.
- D. Exposed Steel Surfaces: Polished chrome plated.
- E. Aluminum: Anodized to color as selected.
- F. Non-ferrous Surfaces: Polished chrome plated.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Verify site conditions.



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METAL TOILET COMPARTMENTS

- B. Verify correct spacing of and between plumbing fixtures.
- C. Verify correct location of built-in framing, anchorage, and bracing.

3.02 INSTALLATION

- A. Install partitions secure, rigid, plumb, and level in accordance with manufacturer's instructions.
- B. Maintain 3/8 to 1/2 inch (9 to 13 mm) space between wall and panels and between wall and panels and between wall and end pilasters.
- C. Attached panel brackets securely to walls using anchor devices.
- D. Attached panels and pilasters to brackets with tamper proof through bolts and nuts. Locate head rails joints at pilaster center lines.
- E. Install 30 inch (760 mm) wide x 42 inch (1066 mm) high stainless steel protective splash panels on partitions adjacent to urinals. Fasten with stainless steel screws spaced 8 inches (20 mm) oc.
- F. Anchor urinal screen panels to walls with two panel brackets and vertical upright consisting of pilaster. Conceal floor fastenings with pilaster shoes.
- G. Provide adjustment for floor variations with screw jack through steel saddles integral with pilaster. Conceal floor fastenings with pilaster shoes.
- H. Support pilasters from built-in framing using two adjustable hanging studs providing vertical leveling. Conceal ceiling fastenings with pilaster shoe.
- I. Equip each door with two hinges, one door latch, one coat hook and bumper; outswinging door latch.
- J. Install door strike and keeper with door bumper on each pilaster in alignment with door latch.
- K. Field touch-up of scratches or damaged enamel finish will not be permitted.
- L. Replace damaged or scratched materials with new materials.

3.03 ERECTION TOLERANCES

- A. Maximum Variation From True Position: 1/4 inch (6 mm)
- B. Maximum Variation From Plumb: 1/8 inch (3 mm).

3.04 ADJUSTING

- A. Adjust work under provisions of Section 017700.
- B. Adjust and align hardware to uniform clearance at vertical edge of doors, not exceeding 3/16 inch (5 mm).
- C. Adjust hinges to position doors in full closed position when unlatched. Return out swinging doors to closed position.
- D. Adjust adjacent components for consistency of line or plane.

END OF SECTION 10 21 13

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METAL TOILET COMPARTMENTS

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10 28 13  
TOILET ACCESSORIES

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Furnish and install accessories where shown on the Drawings and specified herein. Work of this Section includes prefabricated framed mirrors up to and including units measuring 4'-0" wide x 6'-0" high. Fully review Drawings to confirm items located in restrooms and other areas.

1.02 SUBMITTALS

- A. Submit product literature to the Architect for approval in accordance with Section 01 32 00 of these specifications.

1.03 PRODUCT HANDLING

A. Packaging:

1. Furnish all accessories and concealed mounting devices with each unit clearly marked or numbered in accordance with the schedule.
2. Pack each item complete with all necessary pieces of fasteners.
3. Properly wrap and cushion each item to prevent scratches during delivery and storage.

B. Delivery, Storage and Handling:

1. Deliver all accessories to the installers in a timely manner to ensure orderly progress of the total work.
2. Deliver items in manufacturer's original unopened protective packaging.
3. Store materials in original protective packaging to prevent physical damage, or wetting.
4. Handle so as to prevent damage to finished surfaces.
5. Maintain protective covers on all units until installation is complete. Remove covers at final clean-up of installation.

C. Coordination:

1. Provide all information as requested by other trades so that they may provide cutouts and blocking that occur in their work for the installation of the accessories.

PART 2 – PRODUCTS

2.01 ACCESSORIES

- A. Accessory items listed hereinafter are intended to be manufacturer's current standard catalog items of institutional design and construction and are scheduled on the drawings as enumerated herein:

1. Prefabricated, Framed Mirrors

- a. Manufacturer: Bobrick Washroom Equipment, Inc. or approved equal.
- b. Model: B-290 (See drawings for mirror size)
- c. Material: No. 1 quality 1/4" polished plate glass mirror with stainless steel channel frame. Concealed hangers for frame.
- d. Finish: Bright polished (frame)

2. Grab Bars

- a. Manufacturer: Bobrick Washroom Equipment, Inc. or approved equal.
- b. Model: B-5806 x 42"
- c. Material: Type 304, 18 gauge, Stainless Steel
- d. Finish: Satin
- d. Every stall sized for accessibility by the disabled shall be provided with grab bars in

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TOILET ACCESSORIES

compliance with A.D.A. Title III Design Guidelines.

3. Sanitary Napkin-Tampon Disposal: Provide Disposal Unit for every Women's stall
  - a. Manufacturer: Rubbermaid (no substitutions ISU Standard)
  - b. Model: 6140
  - c. Material: plastic
  - d. Color: white
  - e. Supplier – abc
4. Waste Receptacle (verify use on this Project):
  - a. Manufacturer: Impact Products (no substitution ISU Standard).
  - b. Model: 7703 (41 quart)
  - c. Material: plastic
  - d. Color: grey
  - e. Supplier – abc
5. Toilet Paper Holders
  - a. Twin Roll Jumbo (2-9" Jumbo):
    1. Manufacturer: Prime Source (no substitution ISU Standard).
    2. Model: #34017742100
    3. Color: Translucent Black
    4. Supplier – abc
  - b. Single Roll Jumbo (1-9" Jumbo)
    1. Manufacturer: Spring Grove (no substitution ISU Standard).
    2. Model: #330SPG442789
    3. Color: Translucent Black
    4. Supplier – abc
6. Paper Towel Dispenser
  - a. Manufacturer: Scott (no other substitution ISU Standard).
  - b. Model: #46253-00
  - c. Color: Smoke Plastic
  - d. Supplier – Staples
7. Foam Soap Dispenser
  - a. Manufacturer: GoJo (no substitution ISU Standard)
  - b. Model: 957836 (Staples #) Foam hand soap
  - c. Color: ADX12 Chrome/Black Plastic
  - d. Supplier – Staples

**PART 3 – EXECUTION**

**3.01 SURFACE CONDITIONS**

**A. Inspection:**

1. 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.
2. Verify that accessories may be installed in accordance with the original design, all pertinent codes and regulations, and the referenced standards.

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TOILET ACCESSORIES

3. Verify spacing of plumbing fixtures and toilet partitions that affect installation of accessories.
  - B. Discrepancies:
    1. In the event of discrepancy, immediately notify the Architect/Owner.
    2. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.
- 3.02 INSTALLATION
- A. Anchor all accessories rigidly and securely in place so that accessories are level, plumb, and true-to-line. Fit tightly to surfaces to which they are attached. Use mounting techniques in accordance with the appropriate manufacturer's instruction. Conceal anchorage wherever possible.
  - B. Install manufacturers recommended anchor system for all grab bars.
  - C. Conceal evidence of drilling, cutting and fitting on adjacent finishes.
  - D. Fit flanges of accessories snug to wall surfaces. Provide for caulking in gaps between 90 degree return flanges and finish wall surface after accessories are installed.
- 3.03 COMPLETION OF WORK
- A. Repair or remove and replace all defective or damaged materials and equipment to the satisfaction of the Architect and at no additional cost to the Owner.
  - B. Adjust accessories for proper operation.
  - C. Clean and polish exposed surfaces prior to final inspection.
  - D. Deliver accessories schedule, keys and parts manual as part of project close-out documents. For Owner's permanent records, provide two sets of the following items of manufacturer's literature:
    1. Technical data sheets of each item used for the project.
    2. Service and parts manuals.
    3. Name of local representative to be contacted in the event of need of field service consultation.

END OF SECTION 10 28 13

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TOILET ACCESSORIES

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PLASTIC LAMINATE CASEWORK AND COUNTERTOPS

## PART 1 – GENERAL

## 1.01 SECTION INCLUDES

- A. Cabinets and counter tops.
- B. Casework hardware.

## 1.02 REFERENCES

- A. Countertop Standard: ANSI A161.2
- B. Catalog Standards: Manufacturer's catalog numbers may be shown on drawings or in equipment schedule for convenience in identifying certain cabinet work. Unless modified by notation on drawings or otherwise specified, catalog description for indicated number constitutes requirements for each such cabinet.

## 1.03 SUBMITTALS

- A. Submit under provisions of Section 01 32 00.
- B. Shop Drawings: Indicate casework locations, large scale plans, elevations, rough-in and anchor placement dimensions and tolerances, clearances required.
- C. Product Data: Provide component dimensions, configurations, construction details and joint details.
- D. Samples: Submit two samples, minimum size 3 x 6 inches (75 x 150 mm) of each color of finish.

## 1.04 QUALITY ASSURANCE

- A. Perform Work in accordance with ANSI 161.1.

## 1.05 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.

## 1.06 FIELD MEASUREMENTS

- A. Verify that field measurements are as indicated on shop drawings.

## PART 2 – PRODUCTS

## 2.01 MANUFACTURERS

- A. Stevens Cabinet Company, Inc. Product Architectural Designer Series.
- B. L.S.I. Corp. of America, Inc.
- C. Trimline Product.
- D. Custom fabricated per enclosed specifications.
- E. Or approved equal

## 2.02 BASIC MATERIALS

- A. Particleboard: ANSI A208.1 mat. formed particleboard, Grade 1-M- with minimum density of 40 lbs. per cu. ft., internal bond of 60 psi; and minimum screw holding capacity of 225 lbs. on faces and 200 lbs. on edges.
- B. Plastic Laminate: NEMA LD-3, of thickness, type and grade designation indicated; in colors or patterns and finishes indicated or, if not indicated, as selected by Architect from manufacturer's standard range.
- C. Exposed Surfacing Material of Doors, Drawer Fronts, Fixed Panels, Toeboards and Ends: High pressure decorative laminate, 0.028" thick, General Purpose Type (GP-28).

PLASTIC LAMINATE CASEWORK AND COUNTERTOPS

- D. Semi-Exposed Surfacing Material and Doors: High pressure plastic laminate, 0.020" thick, Cabinet Liner Type (CL-20), in color or pattern and finish matching interior of cabinets, unless otherwise indicated.
- E. Remaining Semi-Exposed Materials: Decorative boards, General Purpose type, conforming to NEMA LQ-1 with decorative faces in patterns or colors and finish indicated or, if not indicated, as selected by Architect from manufacturer's standard range.
- F. Concealed Materials: Any sound dry solid lumber, plywood or particleboard or combination thereof; without defects affecting strength, utility or stability. On concealed surfaces of portions constructed of decorative boards, provide decorative or cabinet liner laminate backing (Light-Duty Type).
- G. Core Material for Plastic Laminates: Industrial Grade Particleboard conforming to ANSI A20B.1, Grade 1-M-2.
- H. Treatment of Exposed and Semi-Exposed Edges: Edges of doors and drawer fronts shall have GP-28 plastic laminate to match fronts.
- I. Cabinet Construction
  - 1. Sides, dividers, tops, bottoms, shelves and stretchers: Not less than 1/2" thick. Provide stretchers at top of base cabinet.
  - 2. Backs: Not less than 3/8" thick for unexposed backs. Exposed backs are to be 3/4" thick panels of balanced construction tenoned into cabinet ends.
  - 3. Drawers
    - a. Sides, subfronts and backs: not less than 1/2" thick.
    - b. bottoms: not less than 1/4" thick particleboard or provide solid wood sides and back.
    - c. Provide box type construction with front, bottom and back rabbeted in sides.
    - d. All joints secured with glue and mechanical fasteners.
    - e. All drawers must be suspended on extension drawer slides.
  - 4. Joinery
    - a. Rabbet backs flush into end panels and secure with concealed mechanical fasteners.
    - b. Connect wall cabinet tops and bottoms and base cabinet bottoms and stretchers to ends and dividers by means of mechanical fasteners.
    - c. Rabbet tops, bottom and backs into end panels or cabinetry corner joints to incorporate fluted dowel pin construction.
  - 5. Subbase: Not less than 3/4" thick, of height and relationship to cabinet fronts and exposed ends as indicated. Rubber base furnished and applied continuously per Section 09650.
  - 6. Toe Board: Not less than 3/4" thick, attached to subbase with concealed fasteners.

## 2.03 COUNTERTOPS

- A. Exposed Surfacing Material: High pressure plastic laminate, 0.050" thick, General Purpose Type (GP-50); except 0.042" thick, Postforming Type (PF-42), where postformed countertop configuration is indicated.
- B. Substrate (Core) for Exposed Surfacing Material: Particleboard.
- C. Countertop Configuration: Provide self-edge countertops with continuous 4" backsplash.
- D. Countertop Thickness: As indicated or, if not indicated, not less than 1-1/4" thick, and unless otherwise indicated, with substrate (core) not less than 3/4" thick.



PLASTIC LAMINATE CASEWORK AND COUNTERTOPS

## 2.04 CABINET AND CASEWORK HARDWARE AND ACCESSORIES

- A. General: Provide manufacturer's standard hardware and accessory units of type, size and finish indicated, complying with ANSI A156.9 or, if not indicated, as selected by Architect from manufacturer's standard range.
- B. Hinge: Institutional type, 5 knuckle with 270 degree swing. Provide one pair for doors less than 4 ft. high and 1-1/2 pair for doors over 4 ft.
- C. Pulls: Selected from manufacturer's standard. Provide 2 pulls for drawers over 24" wide.
- D. Door Catches: Nylon roller spring catch or dual self-aligning permanent magnet type. Provide 2 catches on doors over 4 ft. high.
- E. Drawer Slides: Steel slides with ballbearing nylon rollers. 100# rating. File drawers shall have full extension drawer slides for full access to drawer.
- F. Drawer and Cupboard Locks: Half-mortise type, 5-disc tumbler and dead bolt, round cylinder only exposed, die cast with plated finish.
  - 1. Key each cabinet in room alike.
  - 2. Key each room differently.
  - 3. Provide one master key.
  - 4. Provide two keys each.
- G. Sliding Door Hardware Sets: Manufacturer's standard to suit type and size of sliding door units.
- H. Shelf Support Clips: One-piece molded nylon.
- I. Sinks and Faucets: As specified in Division 22.
- J. Finish: Unless otherwise indicated, provide hardware units with manufacturer's standard, satin finish.

## 2.05 FABRICATION

- A. Shop assemble casework for delivery to site in unit easily handled and to permit passage through building openings.
- B. Fabricate corners and joints without gaps or inaccessible spaces or areas where dirt or moisture could accumulate.
- C. Fabricate each unit rigid, not dependent on building structure adjacent units for rigidity.
- D. Apply laminate backing sheet to reverse side of plastic laminate finished surfaces.
- E. Form edges smooth. Form material for counter tops, facing, shelves, and linings from continuous sheets.
- F. Provide cutouts for plumbing fixtures, appliances, fixtures and fittings. Prime paint contact surfaces of cut edges.
- G. When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide trim for scribing and site cutting.

## 2.06 FINISHES

- A. Exposed To View Surfaces: Plastic Laminate of color and pattern as selected.
- B. Interior Surfaces: Plastic Laminate of color and pattern as selected.

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PLASTIC LAMINATE CASEWORK AND COUNTERTOPS

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions.
- B. Verify adequacy of support framing.

3.02 INSTALLATION

- A. Install casework, components and accessories in accordance with manufacturer's instruction.
- B. Use anchoring devices to suit conditions and substrate materials encountered.
- C. Set casework items plumb and square, securely anchored to building structure.
- D. Carefully scribe casework abutting other components, with maximum gaps of 1/32 inch (1 mm). Use fuller strips not additional overlay trim for this purpose.
- E. Close ends of units, back splashes, shelves and bases.
- F. Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.

3.03 ADJUSTING

- A. Adjust work under provisions of Section 01 77 00.
- B. Adjust doors, drawers, hardware, fixtures, and other moving or operating parts to function smoothly.

3.04 CLEANING

- A. Clean work under provisions of 01 77 00.
- B. Clean casework, counters, shelves and hardware.

3.05 PROTECTION OF FINISHED WORK

- A. Protect finished Work under provisions of Section 01 77 00.
- B. Do not permit finished casework to be exposed to continued construction activity.

3.06 SCHEDULES

- A. See Plans and Details.

END OF SECTION 12 32 16

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PART 1 – GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the contract, including general and supplementary conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. This Section includes the following horizontal and trim solid surface product types:

1. Countertops with sinks
2. Laboratory countertops
3. Lavatory tops with undermount bowls
4. Lavatory tops with integral bowls
5. Reception areas/nurses stations
6. Vanity tops
7. Tabletops
8. Bar tops
9. Seats
10. Cold cafeteria surfaces
11. Hot cafeteria surfaces
12. Windowsills
13. Thermoforming
14. Cove backsplashes
15. Color inlays

- B. Related Sections include the following:

1. Division 05 Section "Metal Fabrications" for Blocking.
2. Division 06 Section "Rough Carpentry" for Blocking.
3. Division 09 Section "Wall Cladding."
4. Division 10 Section "Toilet Partitions."
5. Division 21 Section "Plumbing Fixtures."
6. Division 26 Section "Wiring Devices."

- C. Alternates:

1. Refer to Division 01 Section "Summary of Work" for description of work in this Section affected by alternates if any.

1.03 DEFINITION

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

1.04 SUBMITTALS

- A. Product data:

1. For each type of product indicated.
2. Product data for the following:
  - a. Chemical-resistant tops

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- B. Shop drawings:
  - 1. Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices and other components.
    - a. Show full-size details, edge details, thermoforming requirements, attachments, etc.
    - b. Show locations and sizes of furring, blocking, including concealed blocking and reinforcement specified in other Sections.
    - c. Show locations and sizes of cutouts and holes for plumbing fixtures, faucets, soap dispensers, waste receptacle and other items installed in solid surface.
- C. Samples:
  - 1. For each type of product indicated.
    - a. Submit minimum 6-inch by 6-inch sample in specified gloss.
    - b. Cut sample and seam together for representation of inconspicuous seam.
    - c. Indicate full range of color and pattern variation.
  - 2. Approved samples will be retained as a standard for work.
- D. Product data:
  - 1. Indicate product description, fabrication information and compliance with specified performance requirements.
- E. LEED submittals:
  - 1. Credit EQ 4.1:
    - a. Manufacturer's product data for installation adhesives, including printed statement of VOC content and material safety data sheets.
  - 2. Credits MR 5.1:
    - a. Product data indicating that materials are regionally manufactured and within 500 miles of the project site.
- F. Product certificates:
  - 1. For each type of product, signed by product manufacturer.
- G. Fabricator/installer qualifications:
  - 1. Provide copy of certification number.
- H. Manufacturer certificates:
  - 1. Signed by manufacturers certifying that they comply with requirements.
- I. NSF/ANSI standards:
  - 1. Refer to [www.nsf.org](http://www.nsf.org) for the latest compliance to NSF/ANSI Standard 51 for food zone — all food types.
- J. Maintenance data:
  - 1. Submit manufacturer's care and maintenance data, including repair and cleaning instructions.
    - a. Maintenance kit for finishes shall be submitted.
  - 2. Include in project closeout documents.

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SOLID SURFACE FABRICATIONS

1.05 QUALITY ASSURANCE

A. Qualifications:

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

B. Fabricator/installer qualifications:

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

C. Applicable standards:

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

D. Coordination drawings:

1. Shall be prepared indicating:
  - a. Plumbing work.
  - b. Electrical work.
  - c. Miscellaneous steel for the general work.
  - d. Indicate location of all walls (rated and non-rated), blocking locations and recessed wall items, etc.
2. Content:
  - a. Project-specific information, drawn accurately to scale.
  - b. Do not base coordination drawings on reproductions of the contract documents or standard printed data.
  - c. Indicate dimensions shown on the contract drawings and make specific note of dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements.
  - d. Provide alternate sketches to designer for resolution of such conflicts.
    - 1) Minor dimension changes and difficult installations will not be considered changes to the contract.

E. Drawings shall:

1. Be produced in 1/2-inch scale for all fabricated items.

F. Drawings must be complete and submitted to the architect within 60 days after award of contract for record only.

1. No review or approval will be forthcoming.

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SOLID SURFACE FABRICATIONS

2. Coordination drawings are required for the benefit of contractor's fabricators/installers as an aid to coordination of their work so as to eliminate or reduce conflicts that may arise during the installation of their work.
- G. Pre-installation conference:
1. Conduct conference at project site to comply with requirements in Division 1.
- 1.06 DELIVERY, STORAGE AND HANDLING
- A. Deliver no components to project site until areas are ready for installation.
  - B. Store components indoors prior to installation.
  - C. Handle materials to prevent damage to finished surfaces.
    1. Provide protective coverings to prevent physical damage or staining following installation for duration of project.
- 1.07 WARRANTY
- A. Provide manufacturer's warranty against defects in materials.
    1. Warranty shall provide material and labor to repair or replace defective materials.
    2. Damage caused by physical or chemical abuse or damage from excessive heat will not be warranted.
  - B. Optional Installed Warranty:
    1. To qualify for the optional Installed Warranty, fabrication and installation must be performed by a DuPont Certified Fabrication/Installation source who will provide a brand plate for the application.
    2. This warranty covers all fabrication and installation performed by the certified/approved source subject to the specific wording contained in the Installed Warranty Card.
  - C. Manufacturer's warranty period:
    1. Ten years from date of substantial completion.
- 1.08 MAINTENANCE
- A. Provide maintenance requirements as specified by the manufacturer.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Manufacturers:
  1. Subject to compliance with requirements, provide products by one of the following:
    - a. Corian® surfaces from the DuPont company (basis of design).
    - b. All others must submit prior to Bidding for approval

2.02 MATERIALS

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

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SOLID SURFACE FABRICATIONS

B. Thickness:

1. 1/4 inch
2. 1/2 inch
3. 3/4 inch

C. Edge treatment:

1. 1/4-inch round edge

D. Performance characteristics:

Property	Typical Result	Test
Tensile Strength	6,000 psi	ASTM D 638
Tensile Modulus	1.5 x 10 <sup>6</sup> psi	ASTM D 638
Tensile Elongation	0.4% min.	ASTM D 638
Flexural Strength	10,000 psi	ASTM D 790
Flexural Modulus	1.2 x 10 <sup>6</sup> psi	ASTM D 790
Hardness	>85 Rockwell "M" Scale 56 Barcol Impressor	ASTM D 785 ASTM D 2583
Thermal Expansion	1.80 x 10 <sup>-5</sup> in./in./°F	ASTM D 696
Gloss (60° Gardner)	5–75 (matte—highly polished)	ANSI Z124
Light Resistance	(Xenon Arc) No effect	NEMA LD 3-2000 Method 3.3
Wear and Cleanability	Passes	ANSI Z124.3 & Z124.6
Stain Resistance: Sheets	Passes	ANSI Z124.3 & Z124.6
Fungus and Bacteria Resistance	Does not support microbial growth	ASTM G21&G22
Boiling Water Resistance	No visible change	NEMA LD 3-2000 Method 3.5
High Temperature Resistance	No change	NEMA LD 3-2000 Method 3.6
Izod Impact	0.28 ft.-lbs./in. of notch (Notched Specimen)	ASTM D 256 (Method A)
Ball Impact Resistance: Sheets	No fracture—1/2 lb. ball: 1/4" slab—36" drop 1/2" slab—144" drop	NEMA LD 3-2000 Method 3.8
Weatherability	ΔE* <sub>94</sub> <5 in 1,000 hrs.	ASTM G 155
Toxicity	99 (solid colors) 66 (patterned colors)	Pittsburgh Protocol Test ("LC50" Test)
Flammability Flame Spread Index Smoke Developed Index	All colors (Class I and Class A) <25 <25	ASTM E 84, NFPA 255 & UL723

Shapes meet or exceed the ANSI Z124.3 and ANSI Z124.6 standards for plastic sinks and lavatories. NEMA results based on the NEMA LD 3-2000

2.03 ACCESSORIES

A. Joint adhesive:

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

B. Sealant:

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

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SOLID SURFACE FABRICATIONS

2.04 FACTORY FABRICATION

A. Shop assembly

1. Fabricate components to greatest extent practical to sizes and shapes indicated, in accordance with approved shop drawings and manufacturer's printed instructions and technical bulletins.
2. Form joints between components using manufacturer's standard joint adhesive without conspicuous joints.
  - a. Reinforce with strip of solid polymer material, 2" wide.
3. Provide factory cutouts for plumbing fittings and bath accessories as indicated on the drawings.
4. Rout and finish component edges with clean, sharp returns.
  - a. Rout cutouts, radii and contours to template.
  - b. Smooth edges.
  - c. Repair or reject defective and inaccurate work.

B. Thermoforming:

1. Comply with manufacturer's data.
2. Heat entire component.
  - a. Material shall be uniform, between 275 and 325 degrees Fahrenheit during forming.
3. Form pieces to shape prior to seaming and joining.
4. Cut pieces to finished dimensions.
5. Sand edges and remove nicks and scratches.

2.05 FINISHES

A. Color (selected from Manufacturer's standard color chart):

1. Oceanic

B. Finish:

1. Provide surfaces with a uniform finish.
  - a. Matte; gloss range of 5–20.

PART 3 – EXECUTION

3.01 EXAMINATION

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

3.02 INSTALLATION

- A. Install components plumb, level and rigid, scribed to adjacent finishes, in accordance with approved shop drawings and product data.
  1. Provide product in the largest pieces available.
  2. Form field joints using manufacturer's recommended adhesive, with joints inconspicuous in finished work. Exposed joints/seams shall not be allowed.
  3. Reinforce field joints with solid surface strips extending a minimum of 1 inch on either side of the seam with the strip being the same thickness as the top.



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4. Cut and finish component edges with clean, sharp returns.
  5. Rout radii and contours to template.
  6. Anchor securely to base cabinets or other supports.
  7. Align adjacent countertops and form seams to comply with manufacturer's written recommendations using adhesive in color to match countertop.
  8. Carefully dress joints smooth, remove surface scratches and clean entire surface.
  9. Install countertops with no more than 1/8-inch (3 mm) sag, bow or other variation from a straight line.
- B. Coved backsplashes and applied sidesplashes:
1. Install applied sidesplashes using manufacturer's standard color-matched silicone sealant.
  2. Adhere applied sidesplashes to countertops using manufacturer's standard color-matched silicone sealant.
  3. Adhere to countertops using manufacturer's standard color-matched Joint Adhesive.
- 3.03 REPAIR
- A. Repair or replace damaged work which cannot be repaired to architect's satisfaction.
- 3.04 CLEANING AND PROTECTION
- A. Keep components clean during installation.
- B. Remove adhesives, sealants and other stains.

END OF SECTION 12 36 53

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COMMON WORK RESULTS FOR  
FIRE SUPPRESSION, PLUMBING AND HVAC

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specifications Sections, apply to this and all Sections of Divisions 20, 21, 22 and 23.

1.2 SUMMARY

- A. This Section includes general administrative and procedural requirements for mechanical installations. The following administrative and procedural requirements are included in this Section to expand the requirements specified in Division 1:

1. Requirements of Regulatory Agencies.
2. Abbreviations contained in Specifications.
3. Shop Drawings.
4. Record Drawings
5. Operation and Maintenance Manuals.
6. Drawings.
7. Construction Documents.
8. Work and Workmanship.
9. Coordination between Contractors.
10. Assignment of Miscellaneous Work.
11. Equipment Warranty and Early Equipment Startup.
12. Material Equipment Transport
13. Material Storage.
14. Product and Material Approval.
15. Protection and Treatment of Property.
16. Demolition and Removal of Equipment.
17. Electrical Connections to Equipment and Control Wiring.
18. Attaching to Building Construction.
19. Rough-ins.
20. Mechanical Installations.
21. Cleaning and Touch-up.
22. General Completion Startup/Owner Orientation.
23. Air Filters.

1.3 REQUIREMENT OF REGULATORY AGENCIES

- A. All materials and workmanship shall comply with all applicable codes, specifications, local ordinances, industry standards and utility company regulations.
- B. In case of difference between building codes, specifications, state laws, local ordinances, industry standards, utility company regulations and Contract Documents, the most stringent shall govern. Contractor shall promptly notify Engineer in writing of any such difference.

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- C. Non-compliance: should Contractor perform any work that does not comply with requirements of applicable building codes, state laws, local ordinances, industry standards and utility company regulations, he shall bear all costs arising in correcting the deficiencies.
- D. Applicable codes and standards shall include all state laws, local ordinances, utility company regulations and applicable requirements of the most recent editions of the following nationally accepted codes and standards:
1. The Indiana Building Code. (IBC)
  2. The Indiana Electric Code.
  3. The Indiana Mechanical Code. (IMC)
  4. The Indiana Fuel-Gas Code.
  5. The Indiana Fire Code.
  6. The Indiana Plumbing Code. (IPC)
  7. The Indiana Elevator Code.
  8. The Indiana Handicapped Accessibility Code.
  9. National Fire Protection Associates (NFPA) codes and regulations.
  10. Regulations of the Indiana State Board of Health.
  11. Regulations of the Insurance Bureau of Indiana.
  12. Requirements of Factory Mutual (FM).
  13. Regulations of the Indiana Department of Fire Prevention and Building Services.
  14. The Americans with Disabilities Act (ADA).
  15. All local and municipal codes and/or regulations.
- E. Except as otherwise specified herein, all piping work and materials are to conform to the American Standards Association Code for Pressure Piping.
- F. All fired and unfired pressure vessels furnished and installed under this contract are to conform to all requirements of current edition of State of Indiana Rules and Regulations for Boilers and Unfired Pressure Vessels. Copies of all certificates of tests and construction as required by this code to be turned over to Owner.
- G. Permits: Contractor shall pay for all building permits required by work and permits for opening streets and for connection to various utilities, including fees for water meter installation and any other requirements necessary to carry out his work. Where streets or sidewalks are cut, same must be repaired to at least as good a condition as they were before, all at expense of this Contractor. Permits shall be posted in a prominent place at building site properly protected from weather and physical damage. Maintain and adhere to all project, wage-rate and payroll documentation processes and requirements.
- 1.4 ABBREVIATIONS CONTAINED IN SPECIFICATIONS
- |    |        |  |
|----|--------|--|
| A. | AABC   | Associated Air Balance Council   |
| B. | AASHTO | American Assn. of State Highway and Transportation Officials   |
| C. | ABMA   | American Bearing Manufacturers Association (formerly Anti-Friction Bearing Manufacturers Associates) |
| D. | ABMA   | American Boiler Manufacturers Association  |
| E. | ACI    | American Concrete Institute  |

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F.	ACIL	The Association of Independent Scientific, Engineering, and Testing Firms
G.	ACPA	American Concrete Pipe Association
H.	ADA	Americans with Disabilities Act
I.	ADC	Air Diffusion Council
J.	AFBMA	Anti-Friction Bearing Manufacturers Association (see ABMA)
K.	AGA	American Gas Association
L.	AIA	American Insurance Association
M.	AIHA	American Industrial Hygiene Association
N.	AISC	American Institute of Steel Construction
O.	AISI	American Iron and Steel Institute
P.	AMA	Air Moving & Conditioning Association
Q.	AMCA	Air Movement and Control Association International, Inc.
R.	ANSI	American National Standards Institute
S.	API	American Petroleum Institute
T.	AREA	American Railway Engineering Association
U.	ARI	Air-Conditioning and Refrigeration Institute
V.	ASA	American Standards Association
W.	ASA	Acoustical Society of America
X.	ASC	Adhesive and Sealant Council
Y.	ASHRAE	American Society of Heating, Refrigerating & Air-Conditioning Engineers
Z.	ASME	American Society of Mechanical Engineers
AA.	ASPE	American Society of Plumbing Engineers
BB.	ASTM	American Society for Testing Materials
CC.	AWS	American Welding Society
DD.	AWWA	American Water Works Association
EE.	AABC	Associated Air Balance Council
FF.	CAGI	Compressed Air and Gas Institute
GG.	CE	Corps of Engineers (U.S. Department of the Army)
HH.	CGA	Compressed Gas Association
II.	CISPI	Cast Iron Soil Pipe Institute
JJ.	CPPA	Corrugated Polyethylene Pipe Association
KK.	CTI	Cooling Tower Institute
LL.	DIPRA	Ductile Iron Pipe Research Association
MM.	DOT	Department of Transportation
NN.	EPA	Environmental Protection Agency
OO.	FAA	Federal Aviation Administration

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PP.	FCC	Federal Communications Commission
QQ.	FDA	Food and Drug Administration
RR.	FIA	Factory Insurance Association
SS.	FCI	Fluid Controls Institute
TT.	FM	Factory Mutual System
UU.	HEI	Heat Exchange Institute
VV.	HI	Hydraulic Institute
WW.	HI	Hydronics Institute (Division of Gas Appliance Manufacturers Association)
XX.	INCE	Institute of Noise Control Engineering
YY.	IEEE	Institute of Electrical & Electronic Engineers
ZZ.	IRI	Industrial Risk Insurance
AAA.	ISA	International Society for Measurement and Control
BBB.	ITS	Intertek Testing Services (Formerly Inchcape Testing Services)
CCC.	MCAA	Mechanical Contractors Association of America
DDD.	MSS	Manufacturing Standardization Society of the Valve and Fittings Industry
EEE.	NACE	National Association of Corrosion Engineers
FFF.	NBS	National Bureau of Standards
GGG.	NCAC	National Council of Acoustical Consultants
HHH.	NCCA	National Coil Coaters Association
III.	NCPI	National Clay Pipe Institute
JJJ.	NCSPA	National Corrugated Steel Pipe Association
KKK.	NEBB	National Environmental Balancing Bureau
LLL.	NEC	National Electric Code
MMM.	NECA	National Electrical Contractors Association
NNN.	NEMA	National Electrical Manufacturers Association
OOO.	NETA	InterNational Electrical Testing Association
PPP.	NFPA	National Fire Protection Association
QQQ.	NIA	National Insulation Association (Formerly National Insulation and Abatement)
RRR.	NIST	National Institute of Standards and Technology (U.S. Department of Commerce)
SSS.	NUSIG	National Uniform Seismic Installation Guidelines
TTT.	OSHA	Occupational Safety & Health Administration (U.S. Department of Labor)
UUU.	PCA	Portland Cement Association
VVV.	PDI	Plumbing and Drainage Institute
WWW.	PPFA	Plastic Pipe and Fittings Association
XXX.	PPI	Plastics Pipe Institute
YYY.	RMA	Rubber Manufacturers Association

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ZZZ.	SAE	SAE International
AAAA.	SAE	Society of Automotive Engineers
BBBB.	SMACNA	Sheet Metal & Air Conditioning Contractors' National Association
CCCC.	STI	Steel Tank Institute
DDDD.	SWPA	Submersible Wastewater Pump Association
EEEE.	UL	Underwriters Laboratories
FFFF.	UNI	Uni-Bell PVC Pipe Association
GGGG.	WSC	Water Systems Council

1.5 SHOP DRAWINGS

- A. Review of Shop Drawings does not relieve Contractor of responsibility for correct ordering of material and equipment.
- B. Contractor review should ensure that equipment will fit into available space.
- C. Shop Drawings shall be prepared and submitted in accordance with Division 1 "Submittals".
- D. Include all significant data on Shop Drawing Submittals shown in Specifications and Equipment Schedule. Including, but not limited to the following:
  - 1. Name each piece of equipment by scheduled name, noted as: "Mark No." as indicated on drawings, i.e., FC-A, CSAC-A, etc.
  - 2. Pressure drops at design flow.
  - 3. Electrical characteristics and wiring diagrams: Power, signal, and control wiring. Wiring diagrams must match the equipment provided. Custom factory wiring such as terminal strip designations must be provided. Costs associated with field changes required if accurate wiring diagrams are not provided shall be borne by the equipment manufacturer.
  - 4. Description of construction and material types and gauge of materials used.
  - 5. Entering and leaving air and or water temperature at design conditions.
  - 6. Performance characteristics/efficiency.
  - 7. Dimensional drawing showing locations of all field connections including piping, control, power and sheet metal as well as equipment configuration.
  - 8. Dimensional drawing showing locations of all field connections including piping, control, power and sheet metal as well as equipment configuration.
  - 9. Note any special tools required for equipment service.
- E. Items Requiring Submittals:
  - 1. Each individual section lists the required items to be submitted.

1.6 RECORD DRAWINGS

- A. Contractor shall be responsible for furnishing to Engineer a complete, accurate and neat set of marked-up blue-line drawings in accordance with Division 1. This set shall contain all deviations between actual construction and Contract Drawings.
- B. Contractor shall maintain a mark-up set of as-built drawings on the project site and shall keep all drawings up-to-date as construction progresses. This marked-up set shall be returned to Contractor, as many times as necessary, in order to obtain desired results.

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- C. Engineer's employees shall inspect Drawings regularly on project site for accuracy and omissions. Pay request will not be approved if marked-up record drawings are not onsite and up to date.
- D. Refer to Division 1 "PROJECT CLOSEOUT" for further instructions.

1.7 CONSTRUCTION DOCUMENTS

- A. Construction documents shall include all divisions of specifications, all drawings and all issued addenda.
- B. In a case of conflict between the drawings and specifications, or between divisions of specifications, the most stringent condition shall apply.

1.8 OPERATION AND MAINTENANCE MANUALS

- A. Prepare Operation and Maintenance Manuals including the following information for equipment items:
  - 1. Complete index identifying contents of manual. Also provide a comprehensive list of manufacturers, suppliers, subcontractors, etc., with name of contact person, address and phone number for each manufacturer, supplier and subcontractor.
  - 2. Description of function, normal operating characteristics and limitations, performance curves, engineering data and tests, and complete nomenclature and exploded drawing of devices with names and part numbers of replacement parts.
  - 3. Complete set of reviewed shop drawings.
  - 4. Manufacturer's printed operating procedures to include start-up, break-in, and routine and normal operating instructions; regulation, control, stopping, shutdown, and emergency instructions; and summer and winter operating instructions.
  - 5. Maintenance procedures for routine preventative maintenance and troubleshooting; disassembly, repair, and reassembly; aligning and adjusting instructions.
  - 6. Servicing instructions and lubrication charts and schedules.
  - 7. Warranty letter from contractor stating general warranty and any extended warranty items included in this contract.
  - 8. Refer to Division 1 "Contract Closeout" for additional instructions.
  - 9. O&M Manuals shall also be submitted in electronic format and neatly organized to the satisfaction of the engineer.

1.9 DRAWINGS

- A. Mechanical Drawings show general arrangement of all piping, equipment and appurtenances. They shall be followed as closely as actual building construction and work of other trades will permit. Mechanical work shall conform to requirements shown on all Drawings. General and Structural Drawings shall take precedence over Mechanical Drawings. Because of small scale of Mechanical Drawings, it is not possible to indicate all offsets, fittings and accessories, which may be required. Contractor shall investigate structural and finish conditions affecting work and shall arrange his work accordingly, providing such fittings, valves and accessories as may be required to meet such conditions.
- B. For purpose of clarity and legibility, Drawings are essentially diagrammatic, although size and location of equipment and piping are drawn to scale wherever possible. Verify Contract Document information at site.
- C. Drawings indicate required sizes and points of termination of pipes and ducts and suggested routes. It is not the intention of Drawings to indicate all necessary offsets. Install work in manner



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to conform to structure, avoid obstructions, preserve headroom and keep openings and passageways clear. Do not scale from Drawings.

- D. In case of a conflict in construction documents and or the specifications, Contractor shall receive clarification, prior to bidding, in the form of an addendum or include in his price, the greater amount of work of the conflicts shown. (i.e., if two pipe sizes are indicated for the same pipe, the Contractor shall price the larger of the two pipes.)

1.10 WORK AND WORKMANSHIP

- A. Provide all required labor, materials, equipment and Contractor's services necessary for complete installation of systems required in full conformity with requirements of authorities having jurisdiction; and as indicated on Drawings and herein specified.
- B. Finished job shall be functional and complete in every detail, including any and all such items required for a complete system, whether or not these items are specified or shown on drawings.
- C. Any apparatus, material or work not shown on Contract Drawings but mentioned in the Specifications, or vice versa, or any incidental accessories or minor details not shown but necessary to make the work complete in all respects and ready for operation, even if not particularly specified, shall be provided without additional expense to the Owner.
- D. Special attention shall be given to accessibility of working parts and controlling parts. Adjustable parts shall be within easy reach. Removable parts shall have space for removal.
- E. Each Contractor shall acquaint himself with details of all work to be performed by other trades and take necessary steps to integrate and coordinate his work with other trades.
- F. It is assumed the Mechanical Contractor is familiar with standard first-class installation procedures. Therefore, these Specifications do not attempt to include every detail or operation necessary for the complete installation.
- G. It should be particularly noted that the terms "furnish" and "provide" are interchangeable and that each of these terms means to provide, install and connect, unless otherwise stated.
- H. Whenever tables or schedules show quantities of materials, they shall not be used as a guide to Contractor. Each Contractor shall be responsible for furnishing all materials noted on Drawings and as specified.
- I. Craftsman trained in each respective trade shall install work in that trade.

1.11 COORDINATION BETWEEN CONTRACTORS

- A. Note: Respective contractor infers the contractor installing the work.
- B. Each Contractor and Subcontractor shall study all Drawings applicable to this work so complete coordination between trades will be affected. Special attention shall be given to points where ducts cross other ducts or piping, where lights fit into ceilings and where pipe, ducts and conduit pass through walls and columns. Temperature controls interface, where applicable, shall be given attention.
- C. It is responsibility of each Contractor and Subcontractor to leave necessary room for other trades. No extra compensation will be allowed to cover cost of removing piping, conduit, ducts or equipment found encroaching on space required by others.

1.12 ASSIGNMENT OF MISCELLANEOUS WORK

- A. Roof Openings: required by Mechanical Contractor shall be cut by Respective Contractor. Mechanical Contractor is responsible for correct size and location of same.
- B. Roof Curbs and Bases: for roof mounted mechanical equipment shall be furnished and anchored to structure by Respective Contractor.

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- C. Penetrations: holes required for piping or ductwork shall be cut in field at expense of Respective Contractor. Engineer shall give approval prior to any cutting.
  - D. Holes required for piping or ductwork shall be cut or installed as walls are erected at the expense of the Respective Contractor. Mechanical Contractor to coordinate location and size of all openings prior to building erection or he will assume all costs for providing openings.
  - E. Caulking of all plumbing fixtures shall be by Mechanical Contractor.
  - F. All fire stopping of mechanical penetrations by Respective Contractor.
  - G. All caulking of mechanical penetrations through interior partitions by Respective Contractor. All sleeve seals for mechanical penetrations through exterior below grade penetrations by Mechanical Contractor.
  - H. Mechanical Contractor will install all taps, control valves and thermowells in piping for all temperature sensors, flow switches, pressure sensors and any other control device installed in piping whether shown or not on the Drawings.
  - I. Dust Protection:
    - 1. Temporary partitions or barriers required to protect existing building or facilities specifically in areas requiring primarily mechanical work; i.e., cross country pipe, etc., shall be provided by Respective Contractor. Respective Contractor shall coordinate necessity and location of such protection with Owner.
    - 2. Temporary filters and covers for protection of new and existing ductwork, piping, and equipment is required during construction and shall be by Respective Contractor.
  - J. Pipe identification shall be by Mechanical Contractor as specified in Section 20 00 50.
  - K. Temporary Use of Equipment: should it become necessary or desirable to operate any equipment before final acceptance, Owner shall be allowed to do so, ONLY after proper adjustments and trial operation by Contractor specified. Respective Contractor shall be responsible for instructing Owner, or his Representative, as to proper operation and care of equipment so used. If equipment is used prior to final acceptance of job, date of first usage will begin warrantee period.
  - L. All electrical control wiring between mechanical equipment (i.e., air cooled chiller and condensing unit, respective indoor and outdoor equipment, etc.) shall be by Respective Contractor. Conduit and wiring requirements shall adhere to those specified in Division 26.
  - M. Cutting and Patching: Respective Contractor shall cut and patch finished areas as required by Mechanical Contractor.
  - N. Wall Sleeves in new construction for Mechanical systems shall be provided by the Respective Contractor and coordinated by Mechanical Contractor.
  - O. Wall Sleeves in existing construction shall be provided and installed by the Respective Contractor.
  - P. Ceiling and Wall Access Panels: shall be located by mechanical contractor and installed by Respective Contractor.
- 1.13 EQUIPMENT WARRANTY AND EARLY EQUIPMENT STARTUP
- A. Contractor shall provide a complete warranty for all equipment, controls, etc. that includes parts and labor, any equipment that fails shall be repaired and/or replaced at no cost to owner.
  - B. The warranty shall start on the date of substantial completion. On projects with multiple phases, the date of substantial completion of the final phase shall be the date that the warranty starts for all phases, i.e. the entire project. No exceptions.

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- C. If special extended warranties exist, they will be noted in the respective sections. Extended warranty starts on the date of Substantial Completion of the final phase, unless another date is agreed to by all parties.
- D. If equipment startup is required to provide suitable climate conditions for carpentry finish trim, painting, ceiling tile installation, etc., then this contractor is responsible for starting, operating equipment and providing an extended warranty.
- E. Respective Contractor shall provide and change temporary filters over ductwork openings or grilles connected to air handling equipment operated prior to Owner occupancy and Substantial Completion for temporary heating and cooling. Respective Contractor shall submit equipment and ductwork dust protection measures prior to installation of equipment and ductwork.
- F. Some devices such as Control Valves, VFD's, etc. require extended warranties. Extended warranties are noted in the Specification Section for that piece of equipment. The prime Contractor shall be responsible for all implementation and cost of extended warranty work.

1.14 MATERIAL AND EQUIPMENT TRANSPORT

- A. All material and equipment, shipped to site, shall be suitably covered and protected during shipment to site.
- B. Protection shall include shrink wrapping and desiccant bags for humidity controls.
- C. Protect equipment from weather, road salts, road dirt, condensation, damage and all other situations that can be detrimental to the condition of the equipment and material being shipped.
- D. Engineer will not be on site during delivery; however, Engineer reserves the right to reject material or equipment after the fact that is delivered to site in unsatisfactory condition.

1.15 MATERIAL STORAGE

- A. Provide suitable protection from weather and vandalism for all materials and equipment to be installed. Storage shall be dry, clean and safe. Provide heat as required to stop condensation. Condensation occurs during periods of large ambient temperature swings, i.e. spring or fall. Any materials or equipment damaged, deteriorated, rusted or defaced due to improper storage shall be fully repaired, refinished or replaced, as directed by Engineer at no additional cost.

PART 2 - PRODUCTS

2.1 PRODUCT AND MATERIAL APPROVAL

- A. A Specification followed by one or more manufacturers is limited to those manufacturers. Names of other manufacturers may be submitted for approval, to the Engineer, a minimum of ten calendar days prior to receiving bids. Approval will be issued by Addendum if approval is granted.
- B. The mechanical equipment shall be new, listed by UL and shall confirm to NEMA requirements.
- C. If changes in pipe, ductwork, conduit, wiring, structural support, ceiling space, etc. are required as a result of the contractor's decision to purchase equipment with a different arrangement than shown on the Drawings, the Contractor shall be responsible for including all associated costs in their bid. Manufacturers listed on schedules shall be considered "Basis of Design" (BOD). Note that manufacturers listed as equals may have physical characteristics such as weight, footprint, sound levels, electrical, etc., which require more coordination, piping, wiring, and/or general construction changes. The Mechanical Contractor will be responsible for all additional costs associated with the installation of this equipment. Contractors should seek clarification prior to bid for any equipment that does not meet or exceed the scheduled or specified characteristics.
- D. Manufacturers listed for products and equipment does not imply that their standard construction or configuration is acceptable or meets the specifications. Equipment proposed "as equal", must meet the specifications including all architectural, mechanical, electrical, and structural details, all scheduled performance and the job design, plans and specifications.

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PART 3 - EXECUTION

3.1 PROTECTION AND TREATMENT OF PROPERTY

- A. Repair and replace all property damaged in installation of underground lines to meet approval of Owner and authorities having jurisdiction.
- B. Repair streets, which are part of State Highway System to satisfaction of State Highway Department.
- C. Replace base and wearing surfaces of streets with same kind and thickness of material as existing. Replace brick, concrete and asphalt surface to width 6" wider than disturbed area. Replace entire surface if more than 30% has been disturbed.
- D. Replace sidewalks, curbs, gutters, driveways, with same kind and thickness of material. Replace entire section of concrete walks or driveways.
- E. Re-grade and replant lawn areas.
- F. Protect existing utilities. Cap existing utilities that are abandoned.
- G. All property in existing facilities that is damaged/removed, by contractor operations shall be repaired/replaced to previous operating and appearance condition.

3.2 DEMOLITION AND REMOVAL OF EQUIPMENT

- A. Contractor shall remove all equipment, hangers and support for portion of mechanical system in present building as indicated on Drawings and/or implied by nature of the work to be removed. Contractor shall remove all pipes and ductwork back to source made obsolete by removing equipment unless specifically instructed otherwise.
- B. Contractor shall properly support remaining portions of the work. Contractor shall provide valves, plugs, vents, etc. as required so existing systems remain operational.
- C. Owner shall have first right of refusal on all equipment, piping, etc., being removed. If owner decides to keep removed items, then the contractor shall move items to a location on this project site as directed by owner.
- D. Openings remaining after equipment has been removed shall be patched to match surrounding surfaces and in conformance with good practice.

3.3 ELECTRICAL CONNECTIONS TO EQUIPMENT AND CONTROL WIRING

- A. All electrical work shall be done in accordance with the latest edition of the National Electric Code.
- B. All above ground wiring shall be installed in metallic conduit with a minimum conduit size of ¾ inch. All wiring shall be concealed, except in equipment rooms, crawl spaces, tunnels and mechanical or electrical closets. Conduit shall be fastened securely at regular intervals and shall be run parallel to the building lines.
- C. Running low voltage wire above bar joist in roof/floor metal deck flutes is not permitted. Wire to be run above bottom chord of truss and fastened to structure with wire ties at maximum 4'-0" o.c.
- D. All flexible conduits shall not exceed 2'-0".
- E. All below ground wiring shall be installed in rigid conduit with minimum size of ¾". Conduit system shall be sealed watertight.
- F. Provide all wire, conduit, fittings, miscellaneous materials and labor as required for mounting and connecting the electrical control devices furnished in this contract.
- G. All wiring shall be continuous from point to point. No splicing between terminations allowed.

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- H. In the event that a Supplier of equipment requires a larger starter, disconnect wiring conduit, etc. than those indicated in Contract Documents, he shall reimburse Contractor supplying these items for the difference.
  - I. Connections and wiring diagrams shown on Drawings or described in Specifications are typical and for bidding purposes only. Detailed diagrams and instructions shall be provided by Contractor supplying the equipment. If connections are different from those shown on Drawings, Mechanical Contractor shall reimburse Electrical Contractor for those differences.
  - J. Additional relays switches, contactors, etc. which may be required for control purposes in addition to those specified and indicated on Drawings shall be provided by Mechanical Contractor.
  - K. In the event that several pieces of mechanical equipment from different Suppliers are combined in one system, Mechanical Contractor shall furnish complete wiring and control diagrams to enable Electrical Contractor to make proper connections. Diagrams shall be submitted to Engineer for review, prior to actual wiring.
  - L. Mechanical Contractor shall furnish to Electrical Contractor written notice of approval and acceptance for all control wiring installed for mechanical systems by Electrical Contractor. Such approval shall be given within 30 days of completion of all such control wiring. Two copies of letter shall be sent to Engineer.
- 3.4 ATTACHING TO BUILDING CONSTRUCTION
- A. Equipment and pipe supports shall be attached to structural members (beams, joists, etc.) rather than to floor or roof slabs. Support from structural members shall be in accordance with manufacturer recommendation of structural member and/or approved by Structural Engineer.
  - B. Where piping is suspended from new concrete construction, furnish, locate and install black steel channel type concrete inserts before concrete is placed. Fasten inserts to forms and install reinforcing bars through openings at top of inserts. Inserts shall provide for horizontal and vertical adjustments.
  - C. Where piping is suspended from existing concrete or masonry construction, use expansion shields to attach pipe supports to construction.
    - 1. Anchors shall be installed horizontally into the sides (vertical portion) of concrete beams at a minimum of 5" from the bottom of the beam.
    - 2. When support location is between concrete beams, then Unistrut shall be attached to sides of concrete beams and span continuously between the concrete beams. Unistrut shall be sized per manufacturer's data to carry load.
    - 3. Contractor must receive prior approval before attaching to the underside of concrete slabs or concrete beams.
    - 4. Install all anchors according to manufacturer's written instructions. Expansion shield bolt diameter shall be same size as support rod diameter hereinafter specified. If, in the opinion of the Owner/Engineer, existing structure is questionable, an angle will be required with two expansion shields to carry each vertical support rod. Expansion shields shall be combined friction and keying hold type wedge anchor like HILTI Red Head or approved equal.
  - D. Where piping is suspended from structural steel building framing or supporting members, furnish and install beam clamps for attaching piping support device to building member.
  - E. Support piping and ductwork from structure so that equipment connections are not being used for support.

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3.5 ROUGH-IN

- A. Verify final locations for rough-ins with field measurements and with the requirements of the actual equipment to be installed.
- B. Refer to shop drawings for equipment rough-in requirements.

3.6 MECHANICAL INSTALLATIONS

- A. General: Sequence, coordinate, and integrate the various elements of mechanical systems, materials, and equipment. Comply with the following requirements:
  - 1. Keep all major equipment covered, in buildings, until major dust producing activities are complete. Equipment to be covered includes chillers, pumps, VFD's and AHU's.
  - 2. All equipment must be installed such that maintenance and service may be properly accomplished. If necessary, the Owner, at their option, may require the contractor to demonstrate the service on any piece of equipment to determine sufficient service space exists. If the service space is not adequate, the equipment shall be relocated at no additional cost to the Owner such that sufficient service space is achieved.
  - 3. Coordinate mechanical systems, equipment, and materials installation with other building components.
  - 4. Verify all dimensions by field measurements.
  - 5. Arrange for chases, slots, and openings in other building components during progress of construction, to allow for mechanical installations.
  - 6. Coordinate the installation of required supporting devices and sleeves to be set in poured-in-place concrete and other structural components, as they are constructed.
  - 7. Sequence, coordinate, and integrate installations of mechanical materials and equipment for efficient flow of the Work. Give particular attention to large equipment requiring positioning prior to closing in the building.
  - 8. Where mounting heights are not detailed or dimensioned, install systems, material, and equipment to provide the maximum headroom possible.
  - 9. Coordinate connection of mechanical systems with exterior underground and overhead utilities and services. Comply with requirements of governing regulations, franchised service companies, and controlling agencies. Provide required connection for each service.
  - 10. Install systems, materials, and equipment to conform with engineer reviewed submittal data. Conform to arrangements indicated by the Contract Documents, recognizing that portions of the Work are shown only in diagrammatic form. Where coordination requirements conflict with individual system requirements, refer conflict to the Architect/Engineer.
  - 11. Install systems, materials, and equipment level and plumb, parallel and perpendicular to other building systems and components.
  - 12. Install mechanical equipment to facilitate servicing, maintenance, and repair or replacement of equipment components. As much as practical, connect equipment for ease of disconnecting, with minimum of interference with other installations.
  - 13. Extend grease fittings to an accessible location.
  - 14. Install systems, materials, and equipment giving right-of-way priority to systems required to be installed at specified slope.

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15. All shutdowns required to connect to existing systems shall be scheduled and coordinated with the Owner. Contractor shall prefabricate and install new materials as much as possible to keep shutdown duration to a minimum.
16. All pipe, duct and mechanical equipment shall be installed as high above floor (close to structure) as possible. When any pipe, duct or mechanical piece of equipment is installed lower than 7'-0" above finished floor, foam type insulation with black and yellow caution marker tape shall be installed on bottom leading edges.
17. Contractor shall field verify all locations, sizes and connection points to existing piping, ductwork and systems as shown on the drawings. Contact Engineer with any discrepancies.
18. Provide all contact information to Test and Balance Contractor 30 days prior to start-up of equipment.
19. Contact Test and Balance Contractor after leakage and pressure test on air and water systems has been successfully completed.

B. Platforms and Supporting Stands

1. Each piece of equipment or apparatus suspended from ceiling or mounted above floor level shall be provided with suitable structural support, platform or carrier, in accordance with best recognized practice.

3.7 CLEANING AND TOUCH UP

- A. All mechanical equipment, cabinets, control panels and other enclosures shall be cleaned and have paint touched up as necessary to duplicate factory finished appearance. Touch up paint shall exactly match color, composition and quality of factory applied finish.
- B. Equipment furnished with factory applied finish shall be protected from damage by the installing Contractor. Any damaged surface shall be repaired or replaced by the installing Contractor to match original finish or shall be replaced before final acceptance.

3.8 GENERAL COMPLETION, STARTUP

- A. Work Included: furnish materials and labor required to perform startup of equipment and systems installed on project and provide operating instructions to Owner.
- B. It is Mechanical Contractors' responsibility to conduct an owner orientation meeting which will review all systems, their operation and operation of all equipment.
- C. General Requirements.
  1. Inspect bearings for cleanliness and alignment and remove any foreign materials found. Grease as necessary and in accordance with manufacturer's recommendations. Replace bearings that run rough or noisy.
  2. Tighten flanges and packing glands after system has been placed in operation. Replace gaskets in flanges that show any signs of leakage after tightening.
  3. Inspect screwed joints for leakage and remake each joint that appears to be faulty. Do not wait for rust to form. Clean threads on both parts, apply compound and remake joint.
  4. Adjust pipe hangers and supports for correct pitch and alignment.
  5. Flush systems and clean all strainers. After 30 days of operation clean strainers again.
  6. Provide such continuing adjustment services as is necessary to ensure proper functioning of all mechanical systems after building occupancy and during guarantee period.

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7. Provide duct stiffeners, air straighteners, or turning vanes as required to stop any oil canning, drumming or fan surge to the satisfaction of the engineer.

3.9 AIR FILTERS

- A. Provide a total of three (3) sets of air filters for each piece of equipment(AHU's, RTU's, VUV's, CUH's, FC's BC's, etc.) for Owner use after Substantial Completion has been awarded.
- B. Never operate equipment without air filters. Contractor shall provide and change air filters, as needed during construction for equipment operation prior to Substantial Completion.
- C. Replace temporary construction air filters in each and every piece of equipment within 2 weeks after substantial completion. Testing and Balancing shall not commence until filter has been changed within respective equipment.

END OF SECTION 20 00 10



SECTION 20 00 50  
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PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specifications Sections, apply to this and all Sections of Divisions 20, 21, 22 and 23.

1.2 SUMMARY

- A. Provide equipment, materials, labor and services common to more than one section of Divisions 20, 21, 22 and 23. The work generally includes, but is not limited to the following:

1. Vibration Isolators
2. Electric Motors
3. Pressure Gauges
4. Thermometers
5. Separable Sockets
6. Pressure and Temperature Test Plugs (Pete's Plugs)
7. Sleeves
8. Firestop Sealants and Caulks
9. Mechanical Sleeve Seals
10. Elastomeric Joint Sealants
11. Pipe Identification
12. Equipment Identification
13. Paint
14. Concrete
15. Grout
16. Ceiling and Wall Access Panels
17. Thermostats and Sensors
18. Roof & Wall Penetrations

1.3 SUBMITTALS

- A. If specified products are provided, submittals are not required for products provided in this section.
- B. If it is desired to use products that are not specified, then those products must be submitted for review prior to ordering said products.

PART 2 - PRODUCTS

2.1 VIBRATION ISOLATORS

- A. General: Mount equipment on isolators as noted in Schedule of Usage and as noted in specific specification sections. Isolators shall be furnished by manufacturer of isolators. They shall be engineered for specific piece of equipment.

1. Manufacturers:
  - a. Mason Industries, Inc.
  - b. Kinetics Noise Control, Inc.

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B. Types of Isolators

1. Neoprene Pad: Cross ribbed pad 3/8" thick.
2. Cork Rib Pad: 1" thick laminated pad consisting of cork bonded between 2 layers of ribbed neoprene. Vibration Mountings Cork Rib Pak.
3. Steel Spring Mounting: Steel housing containing steel springs with top plate, leveling bolt, snubber fastening slots and neoprene pad bonded to bottom.
4. Rubber in Shear Hanger: Neoprene single or double deflection as required.
5. Spring Type Hangers: Deflection to 2".
6. Combination Spring and Rubber in Shear Hangers: Deflection to 2 1/2".

C. Submittals shall show frequency, required efficiency and designed deflection.

D. All vibration isolators shall be selected at 95% efficiency.

2.2 PRESSURE GAUGES

A. Accuracy ASME/ANSI B40.1 Grade 1A (1%).

B. 6" minimum diameter dial, stainless steel bourdon tube, lower connection.

1. Manufacturers:

- a. Ashcroft 1379S
- b. Hellicoid 440
- c. U.S. Gauge 1600
- d. Duro United Series #10
- e. Weksler 300 Series
- f. Terice No. 4500 Series
- g. McMaster-Carr. High-Accuracy

C. Pressure Snubbers: Piston type like WEKSLER RS1.

2.3 THERMOMETERS

A. Provide and install light powered digital thermometers to meet the following criteria.

1. Display: 3/8" LCD digits
2. Accuracy: 1%
3. Range: -40/300°F
4. Humidity: Operational in ambient conditions up to 100% RH.
5. Case: High impact
6. Stem length to fit separable sockets. Reference separable sockets for required length.
7. Adjustable joint mounting so head can swivel and rotate for best visibility.
8. Heads shall be replaceable without any loss of water from system.

B. Manufacturers:

1. Weiss Vari-angle digital thermometer
2. Trend Instruments Inc.

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- 3. Winters 9IT
- 4. Trerice

2.4 SEPARABLE SOCKETS

- A. Description: Fitting with protective socket for installation in threaded pipe fitting to hold fixed thermometer stem.
  - 1. Material: Brass, for use in copper piping.
  - 2. Material: Stainless steel, for use in steel piping.
  - 3. Material: Steel, for use in steel piping
  - 4. Extension-Neck Length: Nominal thickness of 2 inches (50 mm), but not less than thickness of insulation. Omit extension neck for sockets in piping not insulated.
  - 5. Insertion Length: To extend to a minimum of 1/3 (one-third) of diameter of pipe.

2.5 PRESSURE AND TEMPERATURE TEST PLUGS (PETE'S PLUGS)

- A. Plug shall be brass or stainless steel arranged for a 1/8" diameter shaft to enter into the plug. The plug shall be rated for 350°F for water and 200°F for gases. The plug shall be equipped with a pipe cap. The plug system shall be rated for zero leakage to 250 PSIG.
- B. Manufacturer:
  - 1. Sisco
  - 2. Trerice
  - 3. Peterson Equipment

2.6 SLEEVES

- A. Steel Sheet Metal: 0.0239-inch (0.6-mm) minimum thickness, galvanized, round tube closed with welded longitudinal joint.
- B. Steel Pipe: ASTM A 53, Type E, Grade A, Schedule 40, plain ends.
- C. Stack Sleeve Fittings: Manufactured, cast-iron sleeve with integral clamping flange. Include clamping ring and bolts and nuts for membrane flashing.
- D. Sleeves shall be in accordance with the schedule unless otherwise specified.

PIPE SIZE	UNINSUL.	1" INSUL.	1-1/2" INSUL.	2" INSUL.
1"	2	4	6	6
1-1/2"	3	4	6	8
2"	3	6	8	8
3"	4	6	8	10
4"	6	8	10	10
6"	8	10	12	12
8"	10	12	12	14

2.7 FIRESTOP SEALANTS AND CAULKS

- A. Penetration Sealant:

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1. 3M Brand "Moldable Putty Pads and "Moldable Putty Stix".
  2. 3M Brand "Fire Barrier" Caulk, Putty or Penetrating Sealing Systems.
  3. Dow Corning "Fire Stop Foam" and "Fire Stop Sealant" systems.
  4. Insta-Foam Products, Inc. "Insta-Fire Seal Silicone RTV Foam".
  5. Standard Oil Engineering Materials Company "Fyre Putty".
- B. Intumescent Sealant:
1. 3M Brand "Fire Barrier" caulk or putty, FS-195 Wrap Strip and CS-195 Composite Sheet.
  2. Dow Corning "Fire Stop Intumescent Wrap Strip".
  3. Fox Couplings, Inc. "The Fox Cast-in-Place Coupling".
  4. For plastic pipe penetrations up to 4" diameter: Use 3M pre-manufactured fire barrier plastic pipe devices or equal.
  5. For plastic pipe penetrations larger than 4" diameter: Use 3M fire barrier RC-1 restricting collar with FS-195+ wrap/strip or equal.
- C. Performance Characteristics: Firestopping materials shall conform to both Flame (F) and Temperature (T) rating as tested by nationally accepted test agencies per ASTM E814 or UL 1479 fire tests.
1. F Rating shall be a minimum of one hour but not less than the fire resistance rating of the assembly being penetrated.
  2. Conduct the fire test with a minimum positive pressure differential of 0.01" of water column.
- D. Quality Assurance: Installer qualifications – firm specializing in firestopping installation with not less than two years of experience or trained and approved by firestopping manufacturer.
- 2.8 MECHANICAL SLEEVE SEALS
- A. Description: Modular design with interlocking rubber links shaped to continuously fill annular space between pipe and sleeve. Include connecting bolts and pressure plates.
- B. Manufacturers: Thunderline/Link-Seal; Calpico, Inc.; MetraFlex Co.
- 2.9 ELASTOMERIC JOINT SEALANTS
- A. Sealant: Type S, Grade NS, Class 25, Use O, neutral-curing silicone sealant, unless otherwise indicated. Per ASTM C 920 like Dow Corning 995 GE Silicones, Tremco Spectrum 1 or equal.
- B. Elastomeric Tubing Sealant Backings: Neoprene, butyl, EPDM, or silicone tubing complying with ASTM D 1056, nonabsorbent to water and gas, and capable of remaining resilient at temperatures down to minus 26°F (minus 32°C). Provide products with low compression set and of size and shape to provide a secondary seal, to control sealant depth, and otherwise contribute to optimum sealant performance. Verify compatibility with Elastomeric Joint Sealant Manufacturer prior to use.
- C. Primer: Material recommended by joint sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.
- D. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants with joint substrates.

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2.10 PIPE IDENTIFICATION

A. Banding and labeling shall consist of the following:

1. Color-coded band to conform to color code hereinafter specified.

a. For pipe diameter of 6" or less (including insulation):

<u>PIPE DIA.</u>	<u>SIZE OF LETTERS</u>	<u>LENGTH OF COLOR FIELD</u>
<b>(Use only if banding)</b>		
3/4" – 1 3/8"	1/2"	8"
1 1/2" – 2 3/8"	3/4"	8"
2 1/2" – 6"	1 1/4"	12"

1) Manufacturer: Seton Setmark "SNA" Marker. Graphic Products or approved equal.

b. For pipe diameter of 6" or greater (including insulation):

<u>PIPE DIA.</u>	<u>SIZE OF LETTERS</u>	<u>LENGTH OF COLOR FIELD</u>
<b>(Use only if banding)</b>		
6" – 7 7/8"	1 1/4"	12"
8" – 10"	2 1/2"	24"
Over 10"	3 1/2"	32"

1) Manufacturer: Seton Setmark "STR" Marker, Graphic Products or approved equal.

Compressed Air	Gold Ingot Gold
Natural Gas	Safety Yellow <Include on basic project>
L.P. Gas	Sienna Brown

2.11 PLASTIC LAMINATE SIGNS FOR EQUIPMENT IDENTIFICATION

A. ASTM D 709, Type I, cellulose, paper-base, phenolic-resin-laminate engraving stock; Grade ES-2, black surface, black phenolic core, with white melamine subcore.

1. Engraved with engraver's standard letter style, of sizes and with wording to match equipment identification.
2. Punch for mechanical fastening.
3. Thickness: 1/8 inch (3.2mm) , unless otherwise indicated.
4. Fasteners: Self-tapping stainless-steel screws or contact-type permanent adhesive.
5. Nomenclature: Name and plan number as shown on Equipment Schedules and on Drawings or as directed by the Owner.
6. Size: Approximate 2 1/2 by 4 inches (65 by 100mm) for control devices, dampers, and valves; and 4 1/2 by 6 inches (115 by 150 mm) for equipment.

2.12 GROUT

A. Non-shrink, Nonmetallic Grout: ASTM C 1107, Grade B.

1. Characteristics: Post-hardening, volume-adjusting, dry, hydraulic-cement grout, non-staining, noncorrosive, nongaseous, and recommended for interior and exterior applications.
2. Design Mix: 5000-psi (34.5-MPa), 28-day compressive strength.

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3. Packaging: Premixed and factory packaged.

2.13 THERMOSTATS AND SENSORS

A. Refer to individual equipment specifications and temperature controls specifications for device specifications.

2.14 ROOF AND WALL PENETRATIONS

A. Roof penetration "Roof Vault" by Roof Penetration Housings, LLC. or approved equal.

B. Wall penetration "Wall Vault" by Roof Penetration Housings, LLC. or approved equal.

PART 3 - EXECUTION

3.1 PRESSURE GAUGES

A. Connection in Piping: provide spare pressure snubbers and install ahead of each gauge to minimize gauge needle pulsations as directed by Engineer. Install 1/2" ball valve to isolate each gauge. Mount gauges for maximum visibility from floor.

B. Where gauges are installed across pumps to measure differential pressure, install two (2) 1/2" ball valves, one in pipe from pump suction and one in pipe from pump discharge.

C. Install siphons on all steam gauges: brass or steel.

D. Scale Ranges

1. Domestic Water: 0-150 psig

3.2 THERMOMETERS

A. Connection in piping

1. Mount sockets in vertical up position to facilitate their being filled.

2. Mount and adjust thermometers so they may be read standing on floor without using ladder or straining back.

B. Scale Ranges

1. Domestic Cold Water: 0-130°F

2. Domestic Hot Water: 30-240°F

3.3 PRESSURE AND TEMPERATURE TEST PLUGS (PETE'S PLUGS)

A. Install Pete's Plugs at each and every piece of hydronic equipment including coils, heat exchangers and pumps and install where shown on Drawings.

B. Install Pete's Plugs in 1/4" plugged bosses at pump suction and pump discharge flanges.

C. Always install Pete's Plugs on equipment side of balance valves to measure true differential pressure across equipment, and not across balance valve.

3.4 ESCUTCHEONS

A. Escutcheons: Manufactured wall, ceiling and floor plates; deep-pattern of type required to conceal protruding fittings and sleeves.

1. ID: Closely fit around pipe, tube, and insulation of insulated piping.

2. OD: Completely cover opening and sleeve.

B. Install pipe escutcheons for exposed pipe penetrations of concrete and masonry walls, wall board partitions, and suspended ceilings according to the following:

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1. Chrome-Plated Piping: Cast brass, one piece, with set screw, and polished chrome-plated finish. Use split-casting escutcheons if required, for existing piping.
2. Un-insulated Piping Wall Escutcheons: Cast brass or stamped steel, with chrome-plated finish and set screw.
3. Insulated Piping: Cast brass or stamped steel; with concealed hinge, spring clips, and chrome-plated finish.

3.5 SLEEVES / PENETRATIONS

- A. Sleeves are not required for core drilled holes through poured in place concrete walls.
- B. Install sleeves for pipes and ducts passing through masonry walls, fire rated gypsum-board partitions, gypsum-board partitions with dry wall on both wall faces, and concrete floor slabs.
- C. Sleeve length to be a minimum of 1" longer on each side of wall penetration.
- D. Extend sleeves installed in floors of mechanical equipment areas or other wet areas 2 inches above finished floor level. Extend cast iron sleeve fittings below floor slab as required to secure clamping ring.
- E. Build sleeves into new walls and slabs as work progresses.
- F. Install sleeves large enough to provide 1/4-inch annular clear space between sleeve and pipe or pipe insulation. Use the following sleeve materials:
  1. Steel Pipe Sleeves: For pipes smaller than 6-inch NPS (DN150).
  2. Steel, Sheet-Metal Ductwork Sleeves: For ducts 6 inch and larger, penetrating gypsum-board partitions.
  3. Stack Sleeve Fittings: For pipes penetrating floors with membrane waterproofing. Secure flashing between clamping flanges. Install section of cast-iron soil pipe to extend sleeve to 2 inches above finished floor level.
- G. Where sleeves are to be installed in existing floor or masonry wall, seal space between sleeve and wall with non-shrink grout.
- H. Above Grade wall penetrations, seal annular space between sleeve and pipe or pipe insulation, using elastomeric joint sealants.
- I. Below Grade Exterior-Wall Penetrations and Floors of Mechanical Spaces: Seal penetrations using mechanical sleeve seals. Size penetration for 1-inch annular clear space between pipe and opening for installing mechanical sleeve seals.
  1. Assemble and install mechanical sleeve seals according to manufacturer's written instructions. Tighten bolts that cause rubber sealing elements to expand and make watertight seal.
- J. Fire-Barrier Penetrations:
  1. Maintain indicated fire rating of walls, partitions, ceilings, and floors at pipe and duct penetrations. Seal penetrations with fire sealants and caulks.
  2. This assembly must maintain a watertight seal between floor or wall and pipe when used on exterior walls, or floors of wet areas. Also use mechanical link seals in these cases.
  3. Use intumescent sealant for applications where combustible penetrants are involved (i.e., insulated or plastic pipe).
  4. Install in all penetrations where required by code.
- K. Sealant Application

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1. Install sealants around all piping and duct penetrations.
2. Comply with sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.
3. Sealant Installation Standard: Comply with recommendations of ASTM C 1193 for use of sealants as applicable to materials, applications, and conditions indicated.
4. Acoustical Sealant Application Standard: Comply with recommendations of ASTM C 919 for use of joint sealants in acoustical applications as applicable to materials, applications, and conditions indicated.
5. Install sealant backings of type indicated to support sealants during applications and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
  - a. Do not leave gaps between ends of sealant backings.
  - b. Do not stretch, twist, puncture, or tear sealant backings.
6. Install sealants by proven techniques to comply with the following and at the same time backings are installed:
  - a. Place sealants so they directly contact and fully wet joint substrates.
  - b. Completely fill recess between pipe and opening.
  - c. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
  - d. Remove excess sealants from surfaces adjacent to joint.
  - e. Clean off excess sealants or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of product in which joints occur.

3.6 PIPE IDENTIFICATION

- A. Install Pipe Identification on each system. Include pipe service as abbreviated on Drawings i.e. CHWS, CHWR, etc. and arrows showing normal direction of flow.
  1. Locate pipe identification as follows:
    - a. Exposed piping in unfinished spaces, machine rooms, and accessible maintenance spaces, such as shafts, tunnels, plenums, above lay-in ceilings and exterior non-concealed locations.
    - b. Near each branch, excluding short takeoffs for fixtures and terminal units. Mark each pipe at branch, if flow pattern or service is not obvious.
    - c. Adjacent to penetrations where pipes pass through walls, floors, ceilings, or enter non-accessible enclosures.
    - d. At access doors, manholes and similar access points that permit view of concealed piping.
    - e. At all major equipment and other points of origination and termination.
    - f. Spaced at maximum of 50-foot (15 m) intervals along each run. Reduce intervals to 25 feet (7.5 m) in congested areas of piping and equipment and in equipment rooms.
- B. In all cases, Fire Protection and Natural Gas piping shall be painted in its entirety in all exposed areas including unfinished areas.



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3.7 EQUIPMENT IDENTIFICATION

- A. Install engraved plastic-laminate sign on each scheduled piece of mechanical equipment.
  - 1. Lettering Size: Minimum 1/4 inch (6.4 mm) high lettering for name of unit if viewing distance is less than 24 inches (610 mm), 1/2 inch (12.7 mm) high lettering for distances up to 72 inches (1800 mm) and proportionately larger lettering for greater distances. Provide secondary lettering two-thirds to three-fourths of size of principle lettering.
  - 2. Text of Signs: Provide specific name of unit as identified on Equipment Schedule on Drawings or as directed by the Owner. Inform user of operational requirements, indicate safety and emergency precautions, and warn of hazards and improper operations.
  - 3. Locate identifying devices as necessary for unobstructed view in finished construction.
  - 4. Where equipment is located above lay-in ceiling, affix a 1" adhesive label on ceiling grid system below equipment with equipment tag identification. Verify description requirements with Owner/Engineer. Where equipment is located above inaccessible ceilings, affix label or engraved plastic laminate sign securely to or near access panel.

3.8 ERECTION OF METAL SUPPORTS AND ANCHORAGE

- A. Cut, fit and place miscellaneous metal supports accurately in location, alignment and elevation to support and anchor mechanical materials and equipment.
- B. Field Welding: Comply with AWS D1.1, "Structural Welding Code – Steel".

3.9 GROUTING

- A. Install nonmetallic, non-shrink grout for mechanical equipment base bearing surfaces, pump and other equipment base plates, and anchors. Mix grout according to manufacturer's written instructions.
- B. Clean surfaces that will come into contact with grout.
- C. Provide forms as required for placement of grout.
- D. Avoid air entrapment during placement of grout. To ensure complete grout base, with no voids, pack grout from one side until grout is forced out of opposite side of base.
- E. Place grout, completely filling equipment bases.
- F. Place grout on concrete bases to provide smooth bearing surface for equipment.
- G. Place grout around anchors.
- H. Cure placed grout according to manufacturer's written instructions.

3.10 THERMOSTATS AND SENSORS

- A. Unless specifically noted otherwise, install all wall-mounted thermostats and sensors required for respective equipment with 48" A.F.F. to top of device box. Closely coordinate rough-in locations with all trades.

3.11 ROOF AND WALL PENETRATIONS

- A. Provide pre-manufactured curb or wall box with piping exit seals for moisture tight penetrations. Do not run insulation thru the exit seals. Exit seals to seal tight to carrier pipe.

END OF SECTION 20 00 50

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PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This section specifies piping, valves and fittings including piping support for all systems. These systems include the following:

1. System Piping Schedule #1  
Dual Temperature Water
2. System Piping Schedule #13  
Coil Condensate
3. System Piping Schedule #14  
Sanitary Inside Building  
Vent Inside Building  
Storm Gravity Inside Building
4. System Piping Schedule #17  
Domestic Hot Water Aboveground  
Domestic Cold Water Aboveground
5. System Piping Schedule #19  
Fire Protection

- B. All specialty valves for specific systems are listed in specification sections for those systems. Specialty valves for specific systems can be found in the following sections:

1. Plumbing Specialty Valves – 22 00 00 “Plumbing”
2. Fire Protection Specialty Valves – 21 00 00 “Fire Protection”
3. Hydronic Specialty Valves – 23 00 00 “Heat Transfer”
4. Control Valves – 23 00 00 “Temperature Controls”

- C. Related sections include the following:

1. 20 00 10 Common Work Results for Fire Suppression, Plumbing and HVAC
2. 20 00 50 Common Materials and Methods for Fire Suppression, Plumbing and HVAC
3. 20 01 80 Common Insulation for Plumbing and HVAC
4. 21 00 00 Fire Suppression
5. Division 22 Plumbing
6. Division 23 Mechanical

1.3 SUBMITTAL

- A. Submit product data for valves and fittings used in each system.
- B. Submittal data to be in compliance with Section 20 00 10.
- C. Product data shall include pressure and temperature classifications, model numbers, material types, actuators, trim, valve handle extensions and all pertinent data as required for complete evaluation by Engineer.

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- D. Maintenance data for valves shall include adjusting, servicing, disassembly, exploded view with part numbers and repair instructions.
- E. Piping submittals are not required. However, piping to meet all specifications.

1.4 QUALITY ASSURANCE

- A. ASME Compliance: Comply with ASME B31.9 for building services piping and ASME B31.1 for power piping.
- B. MSS Compliance: Comply with the various MSS Standard Practice documents referenced.
- C. Welded and Soldered Pipe
  - 1. Pipe welding shall comply with provisions of latest revision of applicable code, whether ASME Boiler & Pressure Vessel Code, ASTM Code for Pressure Piping, or such state or local requirements as may supersede code mentioned above.
  - 2. A copy of his welding procedure specification together with proof of its qualification as outlined and required by most recent issue of code having jurisdiction.
  - 3. Submit Operator's qualification record in conformance with provisions of code having jurisdiction, showing that operator was under proven procedure specifications submitted by Contractor.
  - 4. Standard procedure specifications and operators qualified by National Certified Pipe Welding Bureau shall be considered as conforming to requirements of these specifications.
  - 5. Welders to have ASME test papers not more than 5 years old.
  - 6. Each manufacturer or Contractor shall be responsible for quality of welding done by his organization and shall repair or replace work not in accordance with these specifications.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Prepare for shipping as follows:
  - 1. Protect internal parts against rust and corrosion.
  - 2. Protect threads, flange faces, and weld ends.
  - 3. Set globe and gate valves closed to prevent rattling.
  - 4. Set ball and plug valves open to minimize exposure of functional surfaces.
  - 5. Set butterfly valves closed or slightly open.
  - 6. Set butterfly valves closed or slightly open.
- B. Use the following precautions during storage:
  - 1. Maintain valve end protection.
  - 2. Store indoors and maintain valve temperature higher than ambient dew-point temperature. If outdoor storage is necessary, store valves off the ground in watertight enclosures.
  - 3. Stack piping above grade and covered.
- C. Use a sling to handle large valves. Rig to avoid damage to exposed parts. Do not use handwheels and stems as lifting or rigging points.

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PART 2 - PRODUCTS

2.1 PIPE MATERIAL DESIGNATIONS

- A. Refer to System Schedules in Execution portion of this Section for designation of pipe types to be used for each piping system. When more than one piping type is designated, contractor may choose which type is installed.
- B. Piping Designations
1. CP-2 Steel:
    - a. 3/4" to 2" ASTM A53, Type S (seamless) or Type F (furnace-butt welded) Grade A Black steel (galvanized if so noted). U.S. Steel; Laclede; Republic; Youngstown, Jones & Laughlin.
    - b. 2-1/2" to 12" ASTM A53, Type E (electric resistance welded) Grade A Black steel (galvanized if so noted).
    - c. 14" to 20" ASTM A53, Type E (electric resistance welded) Grade B or Type S (seamless), (galvanized if so noted). U.S. Steel; Laclede; Republic; Youngstown; Jones & Laughlin.
  2. CP-8 Copper: ASTM B75, B88, B251 and B447; ASA H23.1-1947 seamless copper tubing, hard temper (soft copper if so noted). Type K or L. (as noted) Chase; Bridgeport, Anaconda; Scovill.
  3. CP-20 Ductile Iron Mechanical Joint: AWWA C151 with Mechanical Joint Bell and plain spigot end, cast iron pipe, centrifugally cast with asphaltum coating. Class as noted in schedule. Pipe to be marked and carry nominal weights and dimensions as required by state and local codes. As manufactured by James B. Clow & Sons; American Cast Iron Pipe; Alabama Pipe; U.S. Pipe & Foundry.
  4. CP-30 PVC: polyvinylchloride; ASTM D 1785 schedule as noted. As manufactured by A.M. Byers; U.S. Steel; Carlon, Crescent; **normal or high impact as noted**.
  5. CP-33 PVC DWV Drainage Pipe: ASTM D2665, Polyvinylchloride pipe solid-wall, waste, and vent. Schedule as noted.
  6. CP-40 Cast Iron (HUB) Bell and Spigot: ASTM A74, extra heavy bell and spigot cast iron soil pipe centrifugally metal or sand spun cast with asphaltum coating. American Brass & Iron; Tyler; Charlotte. Pipe and fittings shall be labeled with the trademark of the Cast Iron Soil Pipe Institute.
  7. CP-41 Soil Pipe: Cast Iron no hub ASTM A888, CISPI 301. No hub cast iron soil pipe centrifugally metal or sand spun cast with asphaltum coating. American Brass & Iron; Tyler; Charlotte. Pipe and fittings shall be labeled with the trademark of the Cast Iron Soil Pipe Institute.

2.2 PIPE FITTING DESIGNATIONS

- A. Refer to System Schedules in Execution portion of this Section for designation of fitting types to be used for each piping system. Fittings to be of the same strength of piping in each respective piping system. When more than one type is designated, contractor may choose which type is installed.
- B. Fitting Designations:
1. CF-1 Malleable Iron: ASME B16.3. 300# (or as noted) black band malleable iron threaded fitting (galvanized if so noted). Flag; Kuhns; Illinois Malleable, Stockham, Anvil.
  2. CF-2 Cast Iron: ASME B16.4; 250# (or as noted) black cast iron threaded fitting (galvanized if so noted). Kuhns, Illinois Malleable; Stockham; Anvil.

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3. CF-4 Flanged: 125# (or as noted) black cast iron, flanged fitting (galvanized if so noted). Kuhns; Stockham; Illinois Malleable, Anvil.
4. CF-5 Wrought Steel fittings: ASTM, B16.9, B16.11, B16.28. Steel butt welding fitting. All elbows shall be long radius, unless otherwise noted. Tube Turns; Midwest; Taylor Forge; Ladish; NIBCO; Grinnell; Weld Bend; Babcock Wilcox.
5. CF-8 Wrought Copper: ASME B16.22. Wrought copper solder joint fitting as manufactured by Flag; Mueller; Chase, NIBCO; Anaconda; American Brass.
6. CF-20 Mechanical Joint: AWWA C111 ductile or grey-iron, standard pattern, same class as noted for pipe. Alabama Pipe, U.S. Pipe & Foundry.
7. CF-30 PVC: Polyvinylchloride; same schedule and impact as noted. Schedule 40 ASTM D 2466 Socket Type, Sch 80 ASTM D 2467 Socket. Carlon; Crescent; A.M. Byers; U.S. Steel; Chemtrol.
8. CF-33 PVC Drainage Fittings: ASTM D2665, socket type, made to ASTM D 3311 drain waste and vent patterns.
9. CF-40 (HUB) Bell and Spigot: Cast iron bell and spigot Type fitting DWV configuration, extra heavy duty. American Brass & Iron; Tyler; Charlotte.
10. CF-41 (NO-HUB) Mechanical Joint: Cast iron no hub type fitting - DWV configuration. American Brass & Iron; Tyler; Charlotte.

2.3 PIPE JOINT DESIGNATIONS

- A. Refer to System Schedules in Execution portion of this Section for designations of joint types to be used for each piping system. When more than one type is designated, contractor may choose which type is installed.
- B. Piping Joint Designations:
  1. CJ-1 Threaded: threads shall conform to ASME B1.20.1, ASTM B16.3, B16.4, B16.12. Remove all burrs. Ream pipe ends to full bore and remove all chips. Use pipe compound on male ends only. Approved pipe compounds: Blue Seal; Key Tite.
  2. CJ-5 Welded Pipe: standard specification provision for fabrication and erection of piping systems as recommended by National Certified Pipe Welding Bureau. All welding of pipe, regardless of condition of is to be installed as follows:
    - a. Pipe welding shall comply with provisions of latest revision of applicable code, whether ASME Boiler & Pressure Vessel Code, ASTM Code for Pressure Piping, or such state or local requirements as may supersede code mentioned above.
    - b. A copy of his welding procedure specification together with proof of its qualification as outlined and required by most recent issue of code having jurisdiction.
    - c. Submit Operator's qualification record in conformance with provisions of code having jurisdiction, showing that operator was under proven procedure specifications submitted by Contractor.
    - d. Standard procedure specifications and operators qualified by National Certified Pipe Welding Bureau shall be considered as conforming to requirements of these specifications.
    - e. Welders to have ASME test papers not more than 5 years old.
    - f. Each manufacturer or Contractor shall be responsible for quality of welding done by his organization and shall repair or replace work not in accordance with these specifications.

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3. CJ-8: 95% tin, 4.85% copper, 0.15% selenium. Premium Contractor Grade solder. 410°F Minimum working temperature; 7130 PSI Tensile Strength, ASTM B32. Like Taramet Sterling, Taracorp. IMACO, Winston-Salem, NC. Cut ends of tubing square with wheel type cutter, ream to remove burrs, wipe clean on inside, apply paste type solder flux on external surface. Apply solder (no lead allowed).
4. CJ-20 Mechanical Joint: AWWA C 111 ductile - or grey – iron glands, rubber gasket and steel bolts. Reinforce joint at hydrants, fittings or valves with heavy wrought iron clamps and wrought iron rods in accordance with standard details of National Board of Fire Underwriters. Apply heavy coat of bituminous solution to assembly.
5. CJ-33 PVC/CPVC
  - a. Solvent Cement: Clean and dry joining surfaces. Join pipe and fittings according to the following:
    - 1) Comply with ASTM F 402 for safe-handling practice of cleaners, primers and solvent cements.
    - 2) ABS piping: ASTM D 2235 and ASTM D 2661.
    - 3) CPVC Piping: ASTM D 2846 and ASTM F-493.
    - 4) PVC Pressure Piping: ASTM D 2672.
    - 5) PVC Non-pressure Piping: ASTM D 2665.
    - 6) PVC to ABS Non-pressure Transition Fittings: Procedure and solvent cement according to ASTM D 3138.
  - b. Heat Welding: ASTM D 2657
  - c. Threads: Use only where noted on schedules. Install as outlined for steel pipe but only to be used on Schedule 80 or 120 pipe. Use strap wrench for tightening.
6. CJ-40 (HUB) Bell & Spigot: Gasket-ASTM C 564, Rubber. American Brass & Iron; Tyler; Charlotte.
7. CJ-41 (No HUB) Coupling: Stainless steel couplings CISPI 310 with ASTM A 167, Type 301 or ASTM A 666 Type 301 Stainless steel corrugated shield; stainless steel bands and sleeve. American Brass & Iron; Tyler; Charlotte.
8. CJ-44 Flanged Joints:
  - a. Cast-Iron Flanges and Flanged Fittings: ASME B16.21, Classes 25, 125 and 250; raised ground face, and bolt holes spot faced. Including bolts, nuts and gaskets.
  - b. Flange bolts and nuts: ASME B18.2, Carbon Steel unless otherwise indicated.

2.4 TRANSITION FITTINGS

- A. Plastic-to-Metal Transition Fittings: CPVC one-piece fitting with manufacturer's Schedule 80 equivalent dimensions; one end with threaded brass insert, and one solvent-cement-joint end.
  1. Manufacturers:
    - a. Eslon Thermoplastics.
- B. Plastic-to-Metal Transition Adaptors: One-piece fitting with manufacturer's SDR 11 equivalent dimension; one end with threaded brass insert, and one solvent-cement-joint end.
  1. Manufacturers:

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- a. Thomson Plastics, Inc.
  - C. Plastic-to-Metal Transition Unions: MSS SP-107, CPVC and PVC four-part union. Include brass end, solvent-cement-joint end, rubber O-ring, and union nut.
    - 1. Manufacturers:
      - a. NIBCO, Inc.
      - b. NIBCO, Inc.; Chemtrol Div.
- 2.5 DIELECTRIC FITTINGS
- A. Description: Combination fitting of copper alloy and ferrous materials with threaded, solder-joint, plain, or weld-neck end connections that match piping system materials.
  - B. Insulating Material: Suitable for system fluid, pressure and temperature.
  - C. Dielectric Unions: Factory-fabricated, union assembly, for 250-psig minimum working pressure at 180 deg F.
    - 1. Manufacturers:
      - a. Capitol Manufacturing Co.
      - b. Central Plastics Company/
      - c. Eclipse, Inc.
      - d. Epco Sales, Inc.
      - e. Hart Industries, International, Inc.
      - f. Watts Industries, Inc.; Water Products Div.
      - g. Zurn Industries, Inc.; Wilkins Div.
  - D. Dielectric Flanges: Factory-fabricated, companion-flange assembly, for 150- or 300- psig minimum working pressure as required to suit system pressures.
    - 1. Manufacturers:
      - a. Capitol Manufacturing Co.
      - b. Central Plastics Company
      - c. Epco Sales, Inc.
      - d. Watts Industries, Inc.; Water Products Div.
  - E. Dielectric-Flange Kits: Companion-flange assembly for field assembly. Include flanges, full-face- or ring-type neoprene or phenolic gasket, phenolic or polyethylene bolt sleeves, phenolic washers, and steel backing washers.
    - 1. Manufacturers:
      - a. Advance Products & Systems, Inc.
      - b. Calpico, Inc.
      - c. Central Plastics Company
      - d. Pipeline Seal and Insulator, Inc.
    - 2. Separate companion flanges and steel bolts and nuts shall have 150- or 300-psig minimum working pressure where required to suit system pressures.



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- F. Dielectric Couplings: Galvanized-steel coupling with inert and non-corrosive, thermoplastic lining; threaded ends; and 300-psig minimum working pressure at 225 deg F.
  - 1. Manufacturers:
    - a. Calpico, Inc.
    - b. Lochinvar Corp.
- G. Dielectric Nipples: Electroplated steel nipple with inert and non-corrosive, thermoplastic lining; plain, threaded ends; and 300-psig minimum working pressure at 225 deg F.
  - 1. Manufacturers:
    - a. Perfection Corp.
    - b. Precision Plumbing Products, Inc.
    - c. Sioux Chief Manufacturing Co., Inc.
    - d. Victaulic Co. of America
    - e. Anvil/Gruvlok

2.6 UNIONS AND FLANGED CONNECTIONS

- A. 150-pound malleable iron with ground joint and brass to iron seats. Crane 1280.
- B. 125-pound wrought copper or cast brass union with solder joint fittings. Crane 633.
- C. 150-pound forged steel flanges with welding neck. Crane 568.
- D. 150-pound bronze flanges with tube stop. Mueller F900.

2.7 VALVE DESIGNATIONS

- A. Refer to System Schedules in Execution portion of this Section for designation of valve types to be used for each piping system.
- B. All valves shall be compatible with the type of piping material installed in the system.

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PART 2 - PRODUCTS (Continued)

VALVE SCHEDULES

1	Refer to System Schedules in Execution portion of this Section for designation of valve types to be used for each piping system.		
2	VALVE DESIGNATION	CV-4	
3	TYPE	Globe	
4	MAXIMUM WORKING		
4.1	Pressure - PSIG	125	
4.2	Temperature - °F	Sat. Stm.	
5	SIZE LIMITS - Inches	1/2 - 2 1/2	
6	DESCRIPTION		
6.1	Body	Bronze	
6.2	Trim	Bronze	
6.3	Disc/plug	Renewable Composite	
6.4	Bonnet	Screw-in	
6.5	Stem	Rising-Silicon Bronze	
6.6	Seat	Integral	
6.7	Agency Compliance	MSS SP-80	
	APPROVED PRODUCTS	Soldered	Threaded
7.1	Nibco	S211	T211
7.2	Crane	1310	1
8	NOTES		
8.1	Provide manufacturer's standard stem packing for service intended.		
8.2	Valves with rising stems suitable for repacking under pressure.		

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PART 2 - PRODUCTS (Continued)

VALVE SCHEDULES

- 1 Refer to System Schedules in Execution portion of this Section for designation of valve types to be used for each piping system.
- 2 VALVE DESIGNATION CV-5
- 3 TYPE Globe
- 4 MAXIMUM WORKING
  - 4.1 Pressure - PSIG 125
  - 4.2 Temperature - °F Sat. Stm.
- 5 SIZE LIMITS - Inches 3 - 12
- 6 DESCRIPTION
  - 6.1 Body Iron ASTM A126
  - 6.2 Trim Bronze
  - 6.3 Disc/plug Renewable Composite
  - 6.4 Bonnet Bolted
  - 6.5 Stem OS&Y
  - 6.6 Seat Renewable Rings
  - 6.7 Agency Compliance MSS SP-85
- 7 APPROVED PRODUCTS
  - 7.1 Nibco F-718-B
  - 7.2 Crane 351
  - 7.3 Jenkins 613CJ
- 8 NOTES
  - 8.1 Provide manufacturer's standard stem packing for service intended.
  - 8.2 Valves with rising stems suitable for repacking under pressure.

SECTION 20 00 60  
COMMON PIPE, VALVES, FITTINGS AND HANGERS  
FOR FIRE SUPPRESSION, PLUMBING AND HVAC

PART 2 - PRODUCTS (Continued)

VALVE SCHEDULES

1	Refer to System Schedules in Execution portion of this Section for designation of valve types to be used for each piping system.				
2	VALVE DESIGNATION	CV-7	CV-8		
3	TYPE	Horizontal Swing Check	Horizontal Swing Check		
4	MAXIMUM WORKING				
4.1	Pressure - PSIG	125	125		
4.2	Temperature - °F	Sat. Stm.	Sat. Stm.		
5	SIZE LIMITS - Inches	0 - 3	2 1/2 - 12		
6	DESCRIPTION				
6.1	Body	Bronze ASTM-B62	Iron ASTM A-126		
6.2	Trim	Bronze	Bronze		
6.3	Disc/plug	Bronze	Renewable Bronze		
6.4	Bonnet	Screw-in	ASTM B-584		
6.5	Seat	Integral	Renewable Rings		
6.6	Agency Compliance	MSS SP-80	MSS SP-71 TYPE I		
7	APPROVED PRODUCTS	Soldered	Threaded	Threaded	Flanged
7.1	Crane	1342	37	372	373
7.2	Nibco	S41BB	T-413B	T-918-13	F-918-13
7.3	Jenkins	762A			
7.4	Victaulic	Series 716		Series 779	

SECTION 20 00 60  
COMMON PIPE, VALVES, FITTINGS AND HANGERS  
FOR FIRE SUPPRESSION, PLUMBING AND HVAC

PART 2 - PRODUCTS (Continued)

VALVE SCHEDULES

1	Refer to System Schedules in Execution portion of this Section for designation of valve types to be used for each piping system.	
2	VALVE DESIGNATION	CV-9
3	TYPE	Non-Slam Wafer Check
4	MAXIMUM WORKING	
4.1	Pressure - PSIG	150 (WOG)
4.2	Temperature - °F	100
5	SIZE LIMITS - Inches	2 - 12
6	DESCRIPTION	
6.1	Body	Semi-Steel, ASTM A-126
6.2	Trim	Bronze ASTM B-62
6.3	Disc/plug	Center Guided
6.4	Bonnet	
6.5	Seat	Renewable Rings
6.6	Agency Compliance	
7	APPROVED PRODUCTS	
7.1	Crane	1400
7.2	Lunkenheimer	-
7.3	Nibco	W910
7.4	Mueller	91 AP, 92 AP
7.5	Victaulic	Series 779

SECTION 20 00 60  
COMMON PIPE, VALVES, FITTINGS AND HANGERS  
FOR FIRE SUPPRESSION, PLUMBING AND HVAC

PART 2 - PRODUCTS (Continued)

VALVE SCHEDULES

- |     |  |                            |
|-----|--|----------------------------|
| 1   | Refer to System Schedules in Execution portion of this Section for designation of valve types to be used for each piping system. |                            |
| 2   | VALVE DESIGNATION  | CV-15                      |
| 3   | TYPE   | Globe<br>Non-Slam<br>Check |
| 4   | MAXIMUM WORKING  |                            |
| 4.1 | Pressure - PSIG  | 125                        |
| 4.2 | Temperature - °F   | 200                        |
| 5   | SIZE LIMITS - Inches   | 4 - 12                     |
| 6   | DESCRIPTION  |                            |
| 6.1 | Body   | Cast Iron                  |
| 6.2 | Trim   | Bronze                     |
| 6.3 | Disc/plug  | Center Guided              |
| 6.4 | Bonnet   |                            |
| 6.5 | Seat   | Bronze                     |
| 7   | APPROVED PRODUCTS  |                            |
| 7.1 | Crane  |                            |
| 7.2 | Lunkenheimer   |                            |
| 7.3 | Jenkins  |                            |
|     | Mueller  | <b>105M AP</b>             |
| 7.4 | Nibco  | <b>F-910</b>               |
| 7.5 | Victaulic  |                            |
| 7.6 | Centerline   |                            |
| 8   | NOTES  |                            |
| 8.1 | Use lift check valves only when noted on Drawings. Lead Free for Domestic Water.   |                            |
| 8.2 | Use viton seat on CV-15 for temperatures above 200°F.  |                            |

SECTION 20 00 60  
COMMON PIPE, VALVES, FITTINGS AND HANGERS  
FOR FIRE SUPPRESSION, PLUMBING AND HVAC

PART 2 - PRODUCTS (Continued)

VALVE SCHEDULES

- |       |   |  |
|-------|---|--|
| 1     | Refer to System Schedules in Execution portion of this Section for designation of valve types to be used for each piping system.                            |  |
| 2     | CLASS NO.   | CV-20  |
| 3     | TYPE  | Ball - Full Port   |
| 4     | MAXIMUM WORKING   |  |
| 4.1   | Pressure - PSIG   | 600  |
| 4.2   | Temperature - °F  | Sat. Stm.  |
| 5     | SIZE LIMITS - Inches  | 1/2 – 2 1/2"   |
| 6     | DESCRIPTION   |  |
| 6.1   | Body/End Piece  | 2-Piece Construction - ASTM B 584 Bronze Body Alloy 844 Forging Brass ASTM B-124 Alloy 377 |
| 6.2   | Ball  | Chromeplated Brass Full Port   |
| 6.3   | Stem  | Bronze or Brass  |
| 6.3.1 |   | Provide with Stem Extension on insulated pipes   |
| 6.4   | Seats/Seals   | Teflon   |
| 6.5   | Agency Compliance   | MSS SP-110   |
| 7     | APPROVED PRODUCTS   | Threaded   |
| 7.1   | Nibco   | T-585-70   |
| 7.2   | Crane/Capri   | 9202   |
| 7.3   | Conbraco Industries, Inc.<br>Apollo Series  | 70-100   |
| 8     | NOTES   |  |
| 8.1   | Soldered valves are not allowed.  |  |
| 8.2   | Provide stem extension or valve manufacturers insulated extension handle system on all valves installed in insulated systems and specified to be insulated. |  |
| 8.3   | Provide lead-free valves for all domestic water applications.   |  |

SECTION 20 00 60  
COMMON PIPE, VALVES, FITTINGS AND HANGERS  
FOR FIRE SUPPRESSION, PLUMBING AND HVAC

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install pipe, valves and fittings for each system as designated in the System Schedules on the following pages.
- B. Reference Products, Part 2 of this Section for specifications and manufacturers of pipes, valves and fittings designated to be installed in System Schedules.



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PART 3 - EXECUTION (Continued)

SYSTEM PIPING SCHEDULE 1  
DUAL TEMPERATURE WATER

1	Install pipe, valves and fittings as designated in this Schedule for this System.			
2	NOMINAL SIZE RANGE			
2.1	Minimal Diameter	1/2"	2 1/2"	10"
2.2	Maximum Diameter	2"	8"	20"
3	DESIGN			
3.1	Working Pressure PSIG	160	160	160
3.2	Working Temperature °F	250	250	250
4	PIPING MATERIAL DESIGNATIONS			
4.1	Soft "K" Copper (See Notes)	CP-8	-	-
4.2	Hard "L" Copper	CP-8	CP-8	-
4.3	Sch. 40 Bl. St. (See Notes)	Not Allowed	CP-2	CP-2
5	FITTING DESIGNATIONS			
5.1	Cold Press	Not Allowed	-	-
5.2	Wrought	CF-8	CF-8	-
5.3	Cast Iron Threaded	-	-	-
5.4	Flanged	Not Allowed	CF-4	CF-4
5.5	Butt Welded	Not Allowed	CF-5	CF-5
5.6	Grooved	Not Allowed	-	-
6	JOINT DESIGNATIONS			
6.1	Cold Press	Not Allowed	-	-
6.2	Solder	CJ-8	CJ-8	-
6.3	Threaded	-	-	-
6.4	Welded	Not Allowed	CJ-5	CJ-5
6.5	Flanged 125#	Not Allowed	CJ-44	CJ-44
6.6	Grooved	Not Allowed	-	-
7	VALVE DESIGNATIONS			
7.1	Ball	CV-20	CV-20	-
7.2	Globe	CV-4	CV-4, 5	CV-5
7.3	Wafer Check	-	CV-9	CV-9
7.5	Globe Check	-	CV-15	CV-15
8	NOTES			
8.1	Pipe installed below grade shall be continuous soft copper. No piping joints allowed below grade. All pipes above grade shall be straight lengths.			

SECTION 20 00 60  
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- 8.2 Buried piping shall be CP-80, no exceptions. See Section 3, Underground Piping for installation requirements.
- 8.3 Use Schedule 30 black steel pipe on all sizes 12" and over.
- 8.4 Use 1/2" pipe only if shown on Drawings.

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PART 3 - EXECUTION (Continued)

SYSTEM PIPING SCHEDULE 13  
COIL CONDENSATE

- |     |  |         |
|-----|--|---------|
| 1   | Install pipe, valves and fittings as designated in this Schedule for this System.  |         |
| 2   | NOMINAL SIZE RANGE   |         |
| 2.1 | Minimum Diameter   | 1"      |
| 2.2 | Maximum Diameter   | 4"      |
| 3   | DESIGN   |         |
| 3.1 | Working Pressure Ft. Hd.   | 10      |
| 3.2 | Working Temperature °F   | Ambient |
| 4   | PIPING DESIGNATIONS  |         |
| 4.1 | Hard "L" Copper  | CP-8    |
| 4.2 | Sch. 40 PVC  | CP-30   |
| 5   | FITTING DESIGNATIONS   |         |
| 5.1 | Wrought  | CF-8    |
| 5.2 | Sch. 40 PVC  | CF-30   |
| 6   | JOINT DESIGNATIONS   |         |
| 6.1 | Solder   | CJ-8    |
| 6.2 | Solvent Cement   | CJ-33   |
| 7   | NOTES  |         |
| 7.1 | PVC piping installed above ceilings and within all plenum types shall be insulated. Reference Insulation Section 20 01 80. |         |
| 7.2 | All coil condensate piping shall be installed with slope of not less than 1/8" per foot.                                   |         |

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COMMON PIPE, VALVES, FITTINGS AND HANGERS  
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PART 3 - EXECUTION (Continued)

SYSTEM PIPING SCHEDULE 14  
SANITARY, VENT AND STORM GRAVITY-INSIDE BUILDING

- 1 Install pipe, valves and fittings as designated in this Schedule for this System.
- 2 ABOVE GRADE
- 2.1 SANITARY & STORM PIPE DESIGNATIONS
- |         | FITTING DESIGNATIONS   | JOINT DESIGNATIONS |                |
|---------|------------------------|--------------------|----------------|
| 2.1.1   | 1 1/2" and Larger      |                    |                |
| 2.1.1.1 | Cast Iron No Hub CP-41 | No Hub CF-41       | Coupling CJ-41 |
| 2.1.1.2 | Sch. 40 DWV PVC CP-33  | PVC CF-33          | Solvent CJ-33  |
- 2.2 VENT PIPE DESIGNATIONS
- |         |                        |              |                |
|---------|------------------------|--------------|----------------|
| 2.2.1   | 1 1/2" and Larger      |              |                |
| 2.2.1.1 | Cast Iron No Hub CP-41 | No Hub CF-41 | Coupling CJ-41 |
| 2.2.1.2 | Sch. 40 DWV PVC CP-33  | PVC CF-33    | Solvent CJ-33  |
- 3 BELOW FLOOR
- 3.1 SANITARY, STORM AND VENT
- 3.1.1 2" and Larger
- |         |                       |           |               |
|---------|-----------------------|-----------|---------------|
| 3.1.1.1 | Cast Iron Hub CP-40   | Hub CF-40 | Gasket CJ-40  |
| 3.1.1.2 | Sch. 40 DWV PVC CP-33 | PVC CF-33 | Solvent CJ-33 |
- 4 NOTES
- 4.1 PVC piping installed above ceilings and within all plenum types shall be insulated. Reference Insulation Section 20 01 80.
- 4.2 All waste pipe below kitchen shall be cast iron below footprint of kitchen.

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COMMON PIPE, VALVES, FITTINGS AND HANGERS  
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PART 3 - EXECUTION (Continued)

SYSTEM PIPING SCHEDULE 17  
 DOMESTIC HOT & COLD WATER  
 ABOVE GROUND

- |     |   |         |      |
|-----|---|---------|------|
| 1   | Install pipe, valves and fittings as designated in this Schedule for this System.       |         |      |
| 2   | NOMINAL SIZE RANGE  |         |      |
| 2.1 | Minimum Diameter  | 1/2"    | 4"   |
| 2.2 | Maximum Diameter  | 3"      | 8"   |
| 3   | DESIGN  |         |      |
| 3.1 | Working Pressure PSIG   | 125     | 125  |
| 3.2 | Working Temperature °F  | 250     | 250  |
| 4   | PIPING DESIGNATIONS   |         |      |
| 4.1 | Hard "L" Copper   | CP-8    | CP-8 |
| 5   | FITTING DESIGNATIONS  |         |      |
| 5.1 | Cold Press  | -       | -    |
| 5.2 | Wrought   | CF-8    | -    |
| 5.3 | Grooved Mech.   | -       | -    |
| 6   | JOINT DESIGNATIONS  |         |      |
| 6.1 | Cold Press  | -       | -    |
| 6.2 | Solder  | CJ-8    | -    |
| 6.3 | Grooved   | -       | -    |
| 7   | VALVES  |         |      |
| 7.1 | Ball  | CV-20   |      |
| 7.2 | Globe   | CV-4, 5 | CV-5 |
| 7.3 | Check Horizontal Swing  | CV-7, 8 | CV-8 |
| 8   | NOTES   |         |      |
| 8.1 | Install ball valves for balancing services.   |         |      |
| 8.2 | Use flange joint on 3" and larger pipe when connection to equipment or valves.          |         |      |
| 8.3 | Saddle type fittings such as Victaulic style 622 and Gruvlok model 6045 are prohibited. |         |      |
| 8.4 | See Division 22 "Plumbing" for special valves.  |         |      |
| 8.5 | Mechanical T-bolted branch outlets not approved.  |         |      |

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PART 3 - EXECUTION (Continued)

SYSTEM PIPING SCHEDULE 19  
 FIRE PROTECTION

1	Install pipe, valves and fittings as designated in this Schedule for this System			
2	LOCATION LIMITES	BELOW GROUND	ABOVE GROUND	
3	NOMINAL SIZE RANGE			
3.1	Minimum Diameter	4"	1"	2 1/2"
3.2	Maximum Diameter	12"	2"	8"
4	DESIGN			
4.1	Working Pressure PSIG	175	175	175
4.2	Working Temperature °F	WOG	WOG	WOG
5	PIPING DESIGNATIONS			
5.1	Ductile Iron	CP-20	-	-
5.2	Sch. 40 Bl. St.	-	CP-2	-
5.3	Sch. 10 Bl. St.	-	-	CP-2
6	FITTING DESIGNATIONS			
6.1	Ductile Iron Mech. Joint	CF-20	-	-
6.2	Class 125 Cast Iron	-	CF-2	-
6.3	Class 150 Malleable Iron	-	CF-1	-
7	JOINT DESIGNATIONS			
7.1	Mechanical Joint	CJ-20	-	-
7.2	Threaded	-	CJ-1	-
7.3	Mech. Grooved	-	-	-
8	NOTES			
8.1	Valves are specified in Fire Protection Section 21 10 00.			
8.2	Provide manufacturer's standard gasket for service intended on mechanical joint pipe.			
8.3	Provide thrust blocks, tie-rods on fittings below grade as required by NFPA #24, Chapter 8.			
8.4	The minimum burial depth of exterior fire protection systems shall be 5'-0".			
8.5	Saddle type fittings are prohibited.			
8.6	Mechanical T-bolted branch outlets not approved.			

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COMMON PIPE, VALVES, FITTINGS AND HANGERS  
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3.2 PIPE SUPPORT

A. Pipe Support

1. Furnish and install supports, guides, anchors and swaybraces required for proper installation and support of pipelines except supports noted to be furnished by others.
2. Pipe suspension shall prevent excessive stress and excessive variation in supporting force. Fabrication and installation of supports for pipelines shall not constrain piping to cause excess transfer of load from supports to piping or from support to support when expansion or contraction occurs. Supports shall be capable of taking entire piping load imposed by expansion or contraction.
3. Where pipe vibration transmits objectionable vibration to building structure or attached equipment, hangers shall be supplemented by spring cushions or an energy absorbing means in the supports themselves, or through the addition of flexible piping connectors or other auxiliary equipment.
4. Piping system where flexibility is not desired shall be supported by rigid hangers.
5. See Section 20 00 10, "Attaching to Building Construction" for attaching pipe support to structure.

B. Vertical Pipe Risers

1. Support vertical runs under 15' long with hanger adjacent to elbows.
2. Support vertical runs over 15' with steel riser clamps. Weld clamps to pipe and support on building structure. Space clamps at every floor with maximum spacing of 28'.

C. Hanger Rods

1. Support horizontal pipe with hot rolled steel rod manufactured in accordance with ASTM A107. Space hanger rods to eliminate pipe sagging. Space hangers as listed below. Place hangers within 12" of each horizontal elbow.

2. Steel and Copper Hanger Spacing

<u>PIPE SIZE (NPS)</u>	<u>ROD SIZE (DIAMETER)</u>	<u>MAXIMUM HANGER SPACING</u>
1/2" thru 1-1/4"	3/8"	6'0"
1-1/2" and 3"	1/2"	10'0"
4" and 5"	5/8"	10'0"
6"	3/4"	10'0"
8" thru 12"	7/8"	15'0"
14" thru 18"	Two 7/8"	15'0"
20" thru 24"	Two 1"	15'0"

3. PVC Pipe Support Spacing

<u>PIPE SIZE (NPS)</u>	<u>ROD SIZE (DIAMETER)</u>	<u>MAXIMUM HANGER SPACING</u>
1/2" thru 1"	3/8"	3'0"
1-1/4" thru 3"	3/8"	4'0"
4" thru 5"	1/2"	4'0"
6"	1/2"	4'0"

4. Piping with caulked joints to be supported at each joint.

D. Pipe Hangers (Pipe Suspended from Above)

1. For Hot Lines or Combination Hot and Cold Lines

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- a. 2" and smaller iron or steel pipe: adjustable steel clevis hangers. Elcen 12; Grinnell 260; Fee & Mason 239; Crawford 11.
  - b. 2" and smaller copper pipe: adjustable copper pipe ring. Elcen 394; Grinnell 97CP; Fee & Mason 365; Crawford.
  - c. 2-1/2" thru 12" iron, steel and copper pipe: adjustable steel clevis hangers. Elcen 12; Grinnell 260; Fee & Mason 239; Crawford 11.
  - d. 2-1/2" thru 12" iron, steel and copper pipe: adjustable swivel pipe roll (one hanger rod). Elcen 14; Grinnell 174; Fee & Mason 272; Crawford 129.
  - e. 14" thru 24" o.d. iron or steel pipe: single pipe roll with adjustable sockets (two hanger rods). Elcen 15; Grinnell 171; Fee & Mason 170; Crawford 15.
2. For Cold Lines
- a. All sizes iron or steel pipe: Elcen 12; Grinnell 260; Fee & Mason 239; Crawford 11.
  - b. All sizes copper pipe: adjustable copper-plated ring. Elcen 394; Grinnell 97CP; Fee & Mason 365; Crawford.
3. All hangers used on lines requiring insulation and vapor barrier shall have hangers oversized to allow insulation to pass thru hanger. Install insulation cradles or wood blocks the same thickness as insulation so insulation will not be crushed. Insulation cradles or wood blocks shall be designed for this specific use.
- E. Pipe Carriers (Pipe Supported from Below on Racks, Piers, Stands or Trapeze Support)
1. For Hot Lines or Combination Hot and Cold Lines
    - a. 3" and smaller Pipe: roller chair with steel U bar support. Elcen 16; Grinnell 176; Fee & Mason 168; Crawford 130.
    - b. 4" and larger Pipe: adjustable pipe roll stand with base plate. Elcen 20; Grinnell 274; Fee & Mason 161; Crawford 19.
  2. For Cold Lines: all pipe sizes supported on steel pipe chair designed to contain pipe movement in direction perpendicular to pipe run but allow some movement in direction of pipe run.
  3. All hangers used on lines requiring insulation and vapor barrier shall have hangers oversized to allow insulation to pass thru hanger. Install insulation cradles or wood blocks the same thickness as insulation so insulation will not be crushed. Insulation cradles or wood blocks shall be designed for this specific use.
- F. For sprinkler piping support refer to NFPA#13 (3-10 hangers).
- G. Supports for sprinkler piping to be in conformance with NFPA 13, if modified by this section.
- H. For piping hanger rod attachment to building, see Section 20 00 10 "Attaching to Building Construction."
- 3.3 INSTALLATION OF VALVES
- A. Locate valves accessibly and arrange to permit easy removal of fixtures and equipment they serve.
  - B. Unless otherwise noted, all valves shall be full size of lines in which they are placed.
  - C. Install all piping and shut-off valves full pipe size as shown on Drawings. Reduce at control valves to control valve size.



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- D. Valves mounted in horizontal lines shall not have their stems and bonnets pointed below horizontal position unless indicated on Drawings.
  - E. Provide valves with 3/4" garden hose adaptor for draining low points, boilers, chillers, coils, etc. with cap and chain. Use ball valves for systems which operate below 120°F. Use gate (Crane 431) or globe valves for systems which operate above 121°F.
  - F. Mount all globe valves to close against flow pressure. Flow should be against bottom of plug.
  - G. Remove bonnets and trim from all valves before soldering, brazing or welding in piping system. Protect seating surfaces during installation. Clean valve parts thoroughly before reassembling. Install bonnet with valve in open position. Follow manufacturers written instructions to protect valves from overheating during installation.
  - H. Install all valves with discs or plugs in open position. Close only when assured that sealing parts are free from foreign material. Weld scale or similar foreign materials found embedded in sealing surfaces will require installation of new trim or complete valve.
  - I. Install valves as required by control contractor.
- 3.4 INSTALLATION OF PIPING
- A. Offset piping to avoid interference with other work to increase head room under piping.
  - B. Contractor may, at his option, use pipe bending equipment to form full lengths of pipe to proper configuration indicated on Drawings.
  - C. Remove raised face from flanges that are to match cast iron flat face patterns.
  - D. Coat studs, nuts, flange faces and metallic gaskets with material similar to molybdenum disulphide before assembly.
  - E. Pipe sizes refer to nominal inside pipe diameter except on copper refrigeration lines and steel and wrought iron pipe 14" and larger.
  - F. Bonney Weldolet Forge Branch Outlet Fittings may be used where steel with welding fittings are specified in lieu of branch outlet tees, provided branch tee is 2 sizes smaller than main. Nipples welded into mains not acceptable.
  - G. Use galvanized fittings and unions with galvanized pipe.
  - H. Caulk clearance space in floor sleeves with plastic compound or fire stop material as required.
  - I. Caulk exterior wall sleeves with thiokol.
  - J. Install chromeplated pipe escutcheons on bare exposed pipe at wall, floor and ceiling penetrations. Reference 20 00 50 Escutcheons.
  - K. Use dielectric couplings when joining dissimilar piping materials.
  - L. Piping shall not pass over electrical apparatus. If conflict is shown on Drawings, notify Engineer prior to installing pipe.
  - M. Refer to General Requirements for installation of sleeves, escutcheons, cutting and fitting and attaching to building construction.
  - N. Refer to Insulation Section 20 01 80 for insulation data. PVC piping installed above ceilings and within all plenum types shall be insulated.
  - O. Conceal all pipes where provisions have been made for this purpose.
  - P. In case of conflict on Drawings as to pipe size, the larger pipe size shall be installed.
  - Q. Joints shall be approved type, gas and watertight for system pressure.

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- R. All pipes shall be cut square, reamed, chamfered and free of all burrs and obstructions. Pipe ends shall have full-bore openings and not be undercut.
  - S. Piping not serving elevator equipment rooms shall not pass through elevator equipment rooms. If conflict is shown on drawings, notify Engineer prior to installing pipe.
  - T. Install wells, thread-o-lets and T's as required by control contractor.
  - U. Copper pipe shall not come in direct contact with mortar or grout. Where copper pipes are exposed to mortar or grout, pipes shall be wrapped with duct tape. This typically happens when pipes pass through masonry walls.
  - V. All pipes to equipment and isolation valves shall be full pipe size as shown on Drawings regardless of equipment connection size. Use reducers at equipment to reduce to equipment size.
  - W. Grooved product must be installed per manufacturer's written instructions, which may or may not include extreme lubricant, torque wrench and specified torque ratings. Manufacturer's representative must provide on-site training to field personnel on installation of product.
  - X. No pulled "T" drilling of copper piping for branch takeoff's allowed.
  - Y. Condensate piping shall be installed with slope of not less than 1/8" per foot.
- 3.5 PIPE CLEANING
- A. Swab to remove dirt or scale.
  - B. Flush water system until water runs clear.
  - C. Operate steam systems until condensate runs clear.
  - D. Clean all strainers and traps.
- 3.6 TESTING PIPING
- A. Test all piping at 1 1/2 times operating pressure.
  - B. Test all concealed work before covering with earth, insulation or furring.
  - C. Notify Engineer not less than 24 hours in advance of all tests.
  - D. Furnish all fuel and necessary equipment required for tests.
  - E. Promptly repair all leaks and reapply tests.
  - F. Install blind flanges or plugs in order to make tests.
  - G. See Specification Divisions 22 and 23 for additional pressure testing requirements.
- 3.7 STERILIZATION OF DOMESTIC WATER SYSTEM
- A. Flush system thoroughly until water runs clear.
  - B. Entire system shall be filled with a water/chlorine solution containing 50 parts per million of chlorine. 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 at least 200 parts per million of chlorine and allowed to stand for three hours.
  - C. Following the allowed standing time, the system shall be flushed with clean potable water until chlorine does not remain in the water coming from the system.
  - D. After the above requirements are satisfied, submit samples to local Board of Health for approval.
  - E. Sterilization shall be redone until approval from the State Board of Health is obtained.

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3.8 PIPING JOINT CONSTRUCTION

- A. Join pipe and fittings according to the following requirements and Division 23 Sections specifying piping systems.
- B. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.
- C. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.
- D. Soldered Joints: Apply ASTM B 813, water-flushable flux, unless otherwise indicated, to tube end. Construct joints according to ASTM B 828 or CDA's "Copper Tube Handbook", using lead-free solder alloy complying with ASTM C 32.
- E. Brazed Joints: Construct joints according to AWS's "Brazing Handbook", "Pipe and Tube" Chapter, using copper-phosphorus brazing filler metal complying with AWS A5.8.
- F. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
  - 1. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.
  - 2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.
- G. Welded Joints: Construct joints according to AWS D10.12, using qualified processes and welding operators according to Part 1 "Quality Assurance" Article.
- H. Flanged Joints: Select appropriate gasket material, size, type and thickness for service application. Install gasket concentrically positioned. Use suitable lubricants on bolt threads.
- I. Plastic Piping Solvent-Cement Joints: Clean and dry joining surfaces. Join pipe and fittings according to the following:
  - 1. Comply with ASTM F 402 for safe-handling practice of cleaners, primers, and solvent cements.
  - 2. CPVC Piping: Join according to ASTM D 2846/D 2846M Appendix.
  - 3. PVC Pressure Piping: Join schedule number ASTM D 1785, PVC pipe and PVC socket fittings according to ASTM D 2672. Join other-than-schedule-number PVC pipe and socket fittings according to ASTM D 2855.
  - 4. PVC Non-pressure Piping: Join according to ASTM D 2855.
- J. Plastic Pressure Piping Gasketed Joints: Join according to ASTM D 3139.
- K. Plastic Non-pressure Piping Gasketed Joints: Join according to ASTM D 3212.
- L. PE Piping Heat-Fusion Joints: Clean and dry joining surfaces by wiping with clean cloth or paper towels. Join according to ASTM D 2657.
  - 1. Plain-End Pipe and Fittings: Use butt fusion.
  - 2. Plain-End Pipe and Socket Fittings: Use socket fusion.
- M. Fiberglass Bonded Joints: Prepare pipe ends and fittings, apply adhesive, and join according to pipe manufacturer's written instructions.

3.9 PIPING CONNECTIONS

- A. Make connections according to the following, unless otherwise indicated:

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1. Install unions, in piping NPS 2-1/2 and smaller, adjacent to each threaded valve and at final connection to each piece of equipment.
2. Install flanges, in piping NPS 2-1/2 and larger, adjacent to flanged valves and at final connection to each piece of equipment.
3. Dry Piping Systems: Install dielectric unions and flanges to connect piping materials of dissimilar metals.
4. Wet Piping Systems: Install dielectric coupling and nipple fittings to connect piping materials of dissimilar metals.
5. "Pulled Tee's" in copper piping are not allowed.

END OF SECTION 20 00 60

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PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This section includes field applied insulation and jacket materials for all systems. These systems include:
  - 1. System Insulation Schedule 2:  
Dual Temperature Pipe
  - 2. System Insulation Schedule 3:  
Coil Condensate Pipe  
Domestic Cold Water Pipe  
Domestic Hot Water Pipe  
Sanitary Waste & Vent
  - 3. System Insulation Schedule 9:  
Heating and Air Conditioning:  
Supply Air Ductwork
  - 4. System Insulation Schedule 9A:  
Air Handling Unit and Boiler:  
Outside Air Intake Ductwork  
Relief/Exhaust Air Ductwork
- B. Any equipment that is to be factory insulated is specified with respective equipment.
- C. All PVC piping installed in a ceiling plenum shall be insulated to provide a flame-spread rating of 25 or less, and smoke-developed rating of 50 or less.
- D. Any piece of equipment, pipe, or duct, installed in this contract, which is typically insulated to prevent condensation, shall be insulated unless specifically noted otherwise.
- E. Internally lined sheet metal is specified in Metal Ducts, Section 23 31 13.
- F. Related sections include all applicable Mechanical Sections.

1.3 SUBMITTALS

- A. Submit product data for insulation, jacket materials and fittings used in each system as required in Section 20 00 10, "Shop Drawings".
- B. Product data shall include thermal conductivity, thickness, jacket material, insulation material, sealing compounds, flame-spread and smoke-developed ratings for each type of product to be used.
- C. Submit test reports of independent testing agency showing conformance with flame-spread and smoke-developed ratings.

1.4 QUALITY ASSURANCE

- A. Insulation Contractor shall have completed a minimum of two (2) projects of similar scope. Upon request, the Insulation Contractor shall provide a list of similar projects and references to the Engineer. The engineer may wish to inspect work previously installed by the Insulation Contractor.
- B. Insulation Installed Indoors: Flame-spread rating of 25 or less, and smoke-developed rating of 50 or less.

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- C. Insulation Installed Outdoors: Flame-spread rating of 75 or less, and smoke-developed rating of 150 or less.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. All insulation to be shipped to site in unopened containers as packaged by Insulation Manufacturers.
- B. All containers shall state contents within.
- C. Store in clean dry area properly protected from weather and physical damage.
- D. Open only containers required to be opened as construction progresses.

1.6 COORDINATION

- A. Coordinate size and location of supports, hangers and insulation shields.
- B. Coordinate hanger sizes and piping penetrations for pipes requiring insulation, wood blocking and saddles with piping installer.

1.7 SCHEDULING

- A. Schedule insulation application after pipe testing and heat trace has been installed.

PART 2 - PRODUCTS

2.1 INSULATION MATERIALS

- A. Refer to Insulation Material Schedules in Execution portion of this Section for Insulation types to be used for each system. When more than one is shown, contractor may choose which type is to be installed.
- B. Fiberglass Insulation
  - 1. Glass fiber bonded with a thermosetting resin with thermal conductivity of .27 or less @ 75°F. Designed for use to 650°F.
    - a. Preformed Pipe Insulation with Jacket: 3 lb/ft<sup>3</sup>, ASTM C547, Type 1, Class 1 with factory applied all-purpose, vapor-retarder ASJ jacket, 0.02 perm max water vapor permeance. Designed for use to 850°F max.
    - b. Board Insulation: 3 lb/ft<sup>3</sup>, ASTM C 612, Type IB, without facing and with FSK jacket manufactured from kraft paper, reinforcing scrim, aluminum foil and vinyl film. Verify jacketing with Engineer prior to insulating exposed ductwork with board insulation within finished spaces. Design for use to 450°F max.
    - c. Blanket Insulation: 3/4 lb/ft<sup>3</sup>, ASTM C 553, Type II, without facing and with FSK manufactured from kraft paper, reinforcing scrim, aluminum foil, and vinyl film. Designed for use to 250°F max.
  - 2. Fire-Resistant Adhesive: Comply with MIL-A-3316C in the following classes and grades:
    - a. Class 1, Grade A for bonding glass cloth and tape to un-faced glass-fiber insulation, for sealing edges of glass-fiber insulation, and for bonding lagging cloth to un-faced glass-fiber insulation.
    - b. Class 2, Grade A for bonding glass-fiber insulation to metal surfaces.
  - 3. Vapor-Retarder Mastics: Fire- and water-resistant, vapor-retarder mastic for indoor applications. Comply with MIL-C-19565C, Type II.
  - 4. Mineral-Fiber Insulating Cements: Comply with ASTM C 195.
  - 5. Expanded or Exfoliated Vermiculite Insulating Cements: Comply with ASTM C 196.

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6. Mineral-Fiber, hydraulic-setting insulating and finishing cement: Comply with ASTM C 449/C 449M.
7. Manufacturers:
  - a. CertainTeed Manson
  - b. Knauf Insulation.
  - c. Owens-Corning Fiberglas Corp.
  - d. Schuller International, Inc.
  - e. Johns Manville

C. Flexible Elastomeric Insulation

1. Closed cellular or expanded rubber material of high insulating efficiency (K of .25 or better @ 75°F) and designed for use with temperatures from -40°F to 210°F. Odorless, self-extinguishing and vapor resistant in compliance with ASTM E-84, 25/50 flame smoke rating. Approved for use in return air plenums.
  - a. Preformed pipe insulation: ASTM C 534, Type I.
  - b. Sheet insulation: ASTM C 534, Type II.
2. Adhesive: As recommended by Insulation Material Manufacturer.
3. Ultraviolet – Protective Coating: As recommended by Insulation Manufacturer.
4. Manufacturers:
  - a. Armacell AP
  - b. K-Flex
  - c. Aeroflex

D. Flexible EPDM Rubber Sheet

1. Flexible closed cell, lightweight elastomeric EPDM material with Ultraviolet resistance and insulating qualities for use outdoors.
2. Technical Data

Property	Test Method	Result
Thickness	-	1 ½".
Thermal Conductivity	ASTM C177/C518	0.245 k-value
Service Temperature	ASTM C 411	-297 F to +300 F
Surface Burning Characteristics	ASTM D 635	Self-Extinguishing
	ASTM E 84	Flame 25, Smoke 50
Water Absorption	ASTM C 209	0.2% max
Vapor Permeance	ASTM E 96	.03 perms
UV Resistance	ASTM G 7/G90	Excellent
Ozone Resistance	ASTM D 1171	No Cracking
Water Vapor Sorption	ASTM C 1104	0.00 %
Fungi Resistance	ASTM C 1338/ G21 /UL181	No Growth

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Dimensional Stability                      ASTM C 356                      7 % max

- 3. Manufacturers:
  - a. Aeroflex USA, Inc. – Aerocell.

E. Duct Liner: See Section 23 31 13.

## 2.2 ADHESIVES

- A. Adhesives or mastics used in the application or manufacture of insulating materials shall be fire retardant with UL flame rating not exceeding 25 and smoke developed rating not exceeding 50 (on dry film) when tested in accordance with ASTM E 84. All adhesives specifically designed for respective application as noted by insulation manufacturer.

## 2.3 JACKETS

### A. PVC Jacket

- 1. High-impact
  - a. Fittings – Gloss White, preformed, 30 Mill, PVC jacket designed for use with and provided by same manufacturer of insulation. Fiberglass insert wrapped around fitting and covered by PVC preformed jacket piping insulation system.
  - b. Sheet – Gloss White, preformed, pre-cut and curled 20 mil PVC jacket designed for use with and provided by same manufacturer of piping insulation system. Ultraviolet-resistant suitable for outdoor service and temperature range 0 – 150°F. Jacket to be completely sealed with solvent weld for vapor proof barrier where noted in schedule.

### B. Foil, Scrim and Kraft-Paper (FSK) Jacket

- 1. Laminated, glass-fiber-reinforced, flame-retardant kraft paper and aluminum foil. Maximum of .02 perms moisture vapor transmission, ASTM C 921, Type I, Max 25/50 flame smoke rating.

### C. All-Service Jacket (ASJ)

- 1. White, kraft-paper fiberglass-reinforced scrim with aluminum-foil backing; complying with ASTM C1136, Type 1.

### D. Aluminum Jacket

- 1. Aluminum roll stock .020" thick, ready for shop or field cutting and forming. ASTM B209, 3003 alloy, H-14 temper.
- 2. Aluminum Fittings - Preformed - same thickness and finish as jacket.
- 3. Jacket Bands - Aluminum 3/4" wide.

### E. Stainless Steel Jacket

- 1. Stainless steel roll stock .020" thick, ready for shop or field cutting and forming. ASTM A66, Type 304 or 316.
- 2. Stainless steel fittings - Gore Type, same thickness and finish as jacket.
- 3. Jacket Bands - Stainless steel, Type 304, 3/4" wide.

### F. Multilayer Weatherproof Jacket:

- 1. Pre-fabricated self-adhering, sheet-type protective membrane. The outer (exposed) layer shall be an embossed, UV-resistant aluminum weathering surface. Under the aluminum shall be multiple layers of tough, high-density cross-linked polymer film. Under the polymer film shall be a uniform layer of aggressive rubberized asphalt adhesive which sticks directly



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to metal, insulation facers and most other clean, dry surfaces. The self-adhesive surface shall be protected by a disposable release liner. Exterior layer shall be brown in color.

2. Technical Data

Property	Test Method	Result
Material Thickness	ASTM D 1970	25 Mils Nom.
Flexibility @ -20°F	ASTM D 1970	Pass
Vapor Permeance	ASTM E 96	.01 perms
Nail Sealability	ASTM D 1970	Pass
Heat Aging	ASTM D 794	Pass
Ultimate Elongation MD	ASTM D 412	434%
Ultimate Elongation CMD	ASTM D 412	246%

2.4 ACCESSORIES AND ATTACHMENTS

A. Glass Cloth and Tape

1. Comply with MIL-C-20079H, Type I for cloth and Type II for tape. Woven glass-fiber fabrics, plain weave, pre-sized a minimum of 8 oz./sq. yd. (270 g/sq. m). Tape Width: 4 inches (100 mm).

B. Bands

1. 3/4 inch (19 mm) wide, in one of the following materials compatible with jacket:
  - a. Stainless Steel: ASTM A 666, Type 304; 0.020 inch (0.5 mm) thick.
  - b. Aluminum: 0.007 inch (0.18 mm) thick.

C. Wire

1. 0.080-inch (2.0 mm), nickel-copper alloy; 0.062-inch (1.6 mm), soft-annealed, stainless steel; or 0.062-inch (1.6 mm), soft-annealed, galvanized steel.

D. Welded-Attached Anchor Pins and Washers

1. Copper-coated steel pin for capacitor-discharge welding and galvanized speed washer. Pin length sufficient for insulation thickness indicated.
  - a. Welded Pin Holding Capacity: 100 lb. (45 kg) for direct pull perpendicular to the attached surface.

E. Adhesive-Attached Anchor Pins and Speed Washers

1. Galvanized steel plate, pin, and washer manufactured for attachment to duct and plenum with adhesive. Pin length sufficient for insulation thickness indicated.
  - a. Adhesive: Recommended by the anchor pin manufacturer as appropriate for surface temperature of ducts, plenums, and breechings; and to achieve a holding capacity of 100 lb. (45 kg) for direct pull perpendicular to the adhered surface.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install Insulation for each system as designated in the Insulation Material Schedules on the following pages.
- B. When more than one type of insulation system is specified, contractor may choose which type is installed.

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- C. Reference Products, Part 2 of this Section for specifications and manufacturers of insulation materials designated to be installed in Insulation Material Schedules.

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3.1 EXECUTION (Continued)

SYSTEM INSULATION SCHEDULE 2:  
 CHILLED WATER PIPE

1	Install insulation materials as designated in this schedule for system listed.		
2	LOCATION	INSIDE	OUTSIDE
3	INSULATION		
3.1	Pipe	Fiberglass-Preformed with Jacket	Fiberglass-Preformed with Jacket
3.2	Fitting	Fiberglass Blanket	Preformed Fitting
4	INSULATION THICKNESS		
4.1	Pipe Size	All	
4.2	Thickness	1"	
5	JACKETS		
5.1	Pipe	ASJ Integral to Insulation	Aluminum Jacket
5.2	Fittings	Preformed PVC	Stainless Steel Jacket
5.3	Vapor-Retardant	Yes	
6	NOTES		
6.1	All chilled water pump bodies, air separators, miscellaneous chilled water equipment, and terminal unit coil specialties (valves, strainers, coil packs, etc.) to be insulated.		

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3.0 EXECUTION (Continued)

SYSTEM INSULATION SCHEDULE 3:  
 COIL CONDENSATE PIPE  
 DOMESTIC COLD WATER PIPE  
 DOMESTIC HOT WATER PIPE  
 SANITARY WASTE & VENT

- |       |  |                                  |         |
|-------|--|----------------------------------|---------|
| 1     | Install insulation materials as designated in this schedule for system(s) listed.                                    |                                  |         |
| 2     | LOCATION   | INSIDE                           | OUTSIDE |
| 3     | INSULATION   |                                  |         |
| 3.1   | Pipe   | Fiberglass-Preformed with Jacket |         |
| 3.2   | Fitting  | Fiberglass Blanket               |         |
| 4     | INSULATION THICKNESS   |                                  |         |
| 4.1   | Pipe Size  | All                              |         |
| 4.2   | Thickness  | 1"                               |         |
| 5     | JACKETS  |                                  |         |
| 5.1   | Pipe   | ASJ Integral to Insulation       |         |
| 5.2   | Fittings   | Preformed PVC                    |         |
| 5.3   | Vapor-Retardant  | Yes                              |         |
| 6     | NOTES  |                                  |         |
| 6.1   | Application of insulation on sanitary waste pipe shall be as follows:  |                                  |         |
| 6.1.1 | Piping installed above ground floor.   |                                  |         |
| 6.1.2 | Serving discharge from cooling coils or electric water coolers.  |                                  |         |
| 6.1.3 | Piping installed in return air plenum.   |                                  |         |
| 6.1.4 | Where insulation is required, install along pipe lengths connecting fixture to waste stack/main building drain only. |                                  |         |
| 6.2   | All PVC piping in return air plenums shall be insulated per this schedule.   |                                  |         |

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3.1 EXECUTION (Continued)

SYSTEM INSULATION SCHEDULE 9:  
 HEATING AND AIR CONDITIONING:  
 SUPPLY AIR DUCTWORK

1	Install insulation materials as designated in this schedule for system.				
2	LOCATION	INSIDE	INSIDE	INSIDE	EXTERIOR
3	INSULATION MATERIAL	Flexible Fiber-glass	Rigid Fiberglass	Flexible Elastomeric	Flexible EPDM Rubber
4	INSULATION THICKNESS	1 1/2"	1 1/2"	3/4"	2"
5	JACKETS	FSK	FSK	FSK	Multi-Layer Weather-proof
5.1	Vapor-Retardant	Yes	Yes	Yes	Yes
6	NOTES				
6.1	Use rigid or flexible elastomeric insulation in mechanical rooms. All other areas may be flexible fiberglass.				
6.2	Where smaller diameter round ductwork is to be insulated and then painted, utilize pre-formed pipe insulation of required thickness with paintable all-service jacket (ASJ).				
6.3	Where ductwork is to be painted, install 3 lb/ft <sup>3</sup> rigid insulation with paintable all-service jacket (ASJ).				
6.4	Insulate ends of reheat coils including VAV box reheat coils in all applications where heating coils are in air conditioning supply ductwork. Install vapor barrier over insulation and seal watertight to adjacent insulation vapor barrier.				
6.5	Externally insulate supply air slot diffuser plenums with flexible fiberglass.				
6.6	External insulation to have a 1" crown on top to shed water.				
6.7	<b>Where supply and return air branch ducts containing volume dampers are covered using duct wrap, expose volume damper actuator through duct wrap and "spot" paint the duct wrap around the actuator a bright and contrasting color for ease in visually locating the actuator while standing on the floor below the duct.</b>				

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3.1 EXECUTION (Continued)

SYSTEM INSULATION SCHEDULE 9A:  
 AIR HANDLING UNIT AND BOILER:  
 OUTSIDE AIR INTAKE DUCTWORK  
 RELIEF/EXHAUST AIR DUCTWORK

- |     |  |                      |                  |
|-----|--|----------------------|------------------|
| 1   | Install insulation materials as designated in this schedule for system.  |                      |                  |
| 2   | LOCATION   | INSIDE               | INSIDE           |
| 3   | INSULATION MATERIAL  | Flexible Fiber-glass | Rigid Fiberglass |
| 4   | INSULATION THICKNESS   | 2"                   | 2"               |
| 5   | JACKETS  | FSK                  | FSK              |
| 5.1 | Vapor-Retardant  | Yes                  | Yes              |
| 6   | NOTES  |                      |                  |
| 6.1 | Insulate all outside air intake ductwork including but not limited to ductwork that serves air handling units and boilers within building envelope. No need to insulate when installed on outside of insulation barrier. |                      |                  |
| 6.2 | Use rigid or flexible elastomeric insulation in mechanical rooms. All other areas may be flexible fiberglass.  |                      |                  |
| 6.3 | Where ductwork is to be painted, install 3 lb/ft <sup>3</sup> rigid insulation with paintable all-service jacket (ASJ).  |                      |                  |
| 6.4 | Boiler and water heater combustion air ductwork shall be insulated from combustion air intake to boiler or water heater intake.  |                      |                  |
| 6.5 | Insulate relief/exhaust air plenums, ductwork, etc., from insulated damper to a point where duct or plenum penetrates building thermal envelope.   |                      |                  |

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3.2 EXAMINATION

- A. Examine substrates and conditions for compliance with requirements for installation and other conditions affecting performance of insulation application.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 PREPARATION

- A. Surface Preparation: Clean and dry surfaces to receive insulation. Remove materials that will adversely affect insulation application.

3.4 GENERAL APPLICATION REQUIREMENTS

- A. All insulation that is to be painted shall have all-service jacket (ASJ) unless noted otherwise.
- B. Apply insulation only after pipes, ducts and equipment have been tested and cleaned.
- C. Protect furniture, equipment, ducts, pipes, etc. with tarpaulins. Keep premises clean.
- D. Apply insulation materials, accessories, and finishes according to the manufacturer's written instructions; with smooth, straight, and even surfaces; and free of voids throughout the entire length.
- E. Refer to schedules at the beginning of this Section for insulation materials and thickness, jackets, and fittings required for each system. Unless otherwise indicated, insulation shall be the same type throughout the same service.
- F. Use accessories compatible with insulation materials and suitable for the service. Use accessories that do not corrode, soften, or otherwise attack insulation or jacket in either wet or dry state.
- G. Where insulation is applied on ducts, pipes and equipment which are against columns, walls or other equipment without adequate space for insulation, finish off insulation in workmanlike manner to meet approval of Engineer.
- H. Apply multiple layers of insulation with longitudinal and end seams staggered.
- I. Seal joints, seams and ends of insulation with vapor-retardant mastic on insulation with a compound recommended by the insulation material manufacturer on systems indicated to receive a vapor retardant.
- J. Keep insulation materials dry during application and finishing.
- K. Insulation shall be applied by craftsmen who are qualified to install insulation.
- L. Apply insulation with tight longitudinal seams and end joints. Bond seams and joints with adhesive recommended by the insulation material manufacturer.
- M. Apply insulation with the least number of joints practical.
- N. Apply insulation over fittings and specialties, with continuous thermal and vapor-retardant integrity, on systems noted to have vapor-retardant jacket.
- O. Provide removable sections of insulation or insulation boxes at all points where access is required for servicing of equipment on systems not requiring vapor-retardant jacket.
- P. Exposed is defined to mean visible from working zones of finished building. Concealed signifies opposite. Pipes and ducts above ceilings and in crawl tunnels are considered to be concealed. Finished rooms are defined as office, workrooms, instruction, storeroom areas, equipment rooms, walking tunnels, etc.
- Q. Aluminum jackets shall be installed in high traffic areas subject to damage.
- R. On systems not requiring vapor-retardant, neatly bevel insulation at all flanges, access cover plates, etc. so that bolts may be removed without disturbing insulation.

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- S. All hangers used on lines requiring insulation and vapor barrier shall have hangers oversized and insulation cradles to allow insulation to pass thru hanger.
  - T. Cut insulation according to manufacturer's written instructions to prevent compressing insulation to less than 75 percent of its nominal thickness.
  - U. Whenever Insulation Jacket is noted as Vapor Retardant: Overlap insulation facing at seams a minimum of one inch and secure with pressure-sensitive tape or adhesive as recommended by Manufacturer.
  - V. Roof Penetrations: Apply insulation for interior applications to a point even with top of roof flashing.
  - W. Seal penetrations with vapor-retardant mastic.
  - X. Apply insulation for exterior applications tightly joined to interior insulation ends.
  - Y. Seal insulation to roof flashing with vapor-retardant mastic.
  - Z. Interior Wall and Partition Penetrations: Apply insulation continuously through walls and partitions.
  - AA. Insulation Terminations: For insulation application where vapor retardants are indicated, taper insulation ends. Seal tapered ends with a compound recommended by the insulation material manufacturer to maintain vapor retardant.
  - BB. Do not insulate over equipment name plate data.
  - CC. Seal all punctures in vapor retardant jacket with vapor-barrier adhesive on cooling piping and air conditioning ducts.
  - DD. Apply adhesives and mastics at the manufacturer's recommended coverage rate.
  - EE. Do not weld brackets, clips, or other attachment devices to item being insulated unless specifically noted to do so.
- 3.5 DUCTWORK AND EQUIPMENT INSULATION
- A. Blanket Insulation Application
    - 1. Apply insulation with integral jackets as follows:
      - a. Pull jacket tight and smooth.
      - b. Install anchor pins and speed washers to keep insulation from sagging when duct width exceeds 22".
      - c. Joints and Seams: Cover with tape and vapor retardant as recommended by insulation material manufacturer to maintain vapor seal.
      - d. Vapor-Retardant Mastics: Where vapor retardants are indicated, apply mastic on seams and joints and at ends adjacent to duct flanges and fittings.
    - 2. Fire-Rated Wall and Partition Penetrations: Terminate insulation at fire-rated wall and partition penetrations. Maintain vapor-retardant barrier.
    - 3. Floor Penetrations: Terminate insulation at underside of floor assembly and at floor support at top of floor. Provide vapor-retardant mastic on insulation indicated to receive vapor-retardant.
  - B. Board and Block Insulation Application
    - 1. Blankets, Board, and Block Applications: Secure insulation with adhesive and anchor pins with speed washers.
      - a. Apply adhesives according to manufacturer's recommended coverage rates per square foot, for 100 percent coverage of surfaces to be insulated.



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- b. Groove and score insulation materials to fit as closely as possible to the surfaces, including contours. Bevel insulation edges for cylindrical surfaces for tight joint. Stagger end joints.
  - c. Protect exposed corners with secured corner angles.
  - d. Install adhesive-attached or self-adhesive anchor pins and speed washers on sides and bottoms of surfaces to be insulated as follows:
    - 1) Do not weld anchor pins to ASME-labeled pressure vessels.
    - 2) 3 inches (75 mm) maximum from insulation end joints, and 16 inches (400 mm) o.c. in both directions.
    - 3) Do not over-compress insulation during installation.
    - 4) Cut and miter insulation segments to fit curved sided and dome heads of tanks and vessels.
- 2. Impale insulation over anchor pins and attach speed washers.
  - 3. Cut excess portion of pins extending beyond speed washers or bend parallel with insulation surface. Cover exposed pins and washers with tape matching insulation facing.
  - 4. Secure each layer of insulation with stainless-steel bands.
  - 5. Stagger joints between insulation layers at least 3 inches (75 mm).
  - 6. Apply insulation in removable segments on access doors and other elements that require removal for service.
  - 7. Bevel and seal insulation ends around access panels, manholes, hand holes, ASME stamps, and nameplates.
  - 8. Apply vapor-retardant mastic to open joints, breaks, and punctures for insulation indicated to receive vapor retardant.
- C. Flexible Elastomeric Thermal Insulation Applications:
- 1. Apply insulation over entire surface to be insulated according to the manufacturer's written instructions.
  - 2. Apply 100 percent coverage of adhesive to surface with manufacturer's recommended adhesive.
  - 3. Seal longitudinal seams and end joints for Vapor Retardant installation.
- 3.6 FIELD-APPLIED JACKET APPLICATION
- A. Apply glass-cloth jacket, where indicated, directly over bare insulation or insulation with factory-applied jackets.
    - 1. Apply jacket smooth and tight to surface with 2-inch (50-mm) overlap at seams and joints.
    - 2. Embed glass cloth between two 0.062-inch- (1.6-mm-) thick coats of jacket manufacturer's recommended adhesive.
    - 3. Completely encapsulate insulation with jacket, leaving no exposed raw insulation.
- 3.7 PIPING APPLICATION REQUIREMENTS
- A. Apply insulation with integral jackets as follows:
    - 1. Pull jacket tight and smooth.
    - 2. Circumferential Joints: Cover with 3-inch- (75-mm-) wide strips, of same material as insulation jacket. Secure strips with adhesive and outward clinching staples along both edges of strip and spaced 4 inches (100mm) o.c.

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3. Longitudinal Seams: Overlap jacket seams at least 1-1/2 inches (40 mm). Apply insulation with longitudinal seams at bottom pipe. Clean and dry surface to receive self-sealing lap. Staple laps with outward clinching staples along edge at 4 inches (100 mm) o.c.
    - a. Exception: Do not staple longitudinal laps on insulation having a vapor retardant.
  4. Vapor-Retardant Mastics: Where vapor retardants are indicated, apply mastic on seams and joints and at ends adjacent to flanges, unions, valves, and fittings.
  5. At penetrations in jackets for thermometers and pressure gages, fill and seal voids with vapor-retardant mastic.
- B. Apply insulation to fittings and elbows as follows:
1. Apply pre-molded insulation sections of the same material as straight segments of pipe insulation where scheduled. Secure according to manufacturer's written instructions.
  2. Apply mitered sections of pipe insulation, or glass-fiber blanket insulation, to a thickness equal to adjoining pipe insulation. Secure insulation materials with wire, tape, or bands.
  3. Apply jacket material overlapping seams at least 1 inch (25 mm) at each end. Secure with manufacturer's recommended adhesive, attachments and accessories. Seal seams with tape. Use vapor-retardant mastic on insulation indicated to receive vapor-retardant.
- C. Apply insulation to valves and specialties as follows:
1. Apply pre-molded insulation sections of the same material as straight segments of pipe insulation when available. Secure according to manufacturer's written instructions.
  2. When pre-molded insulation sections are not available, apply glass-fiber blanket insulation to valve body. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation. For strainers, arrange insulation for access to strainer basket without disturbing insulation.
  3. Use preformed standard PVC fitting covers for valve sizes where available. Secure fitting covers with manufacturer's attachments and accessories. Seal seams with tape. Also, seal seams with vapor-retardant mastic on insulation indicated to receive vapor-retardant.
  4. On piping 3" and smaller, not requiring vapor-retardant, fittings may be insulated with insulating cement equal in thickness to adjoining pipe insulation and troweled to smooth even finish. Do not insulate heating water pipe valves or unions.
  5. For larger sizes where PVC fitting covers are not available, seal insulation with canvas jacket and sealing compound recommended by the insulation material manufacturer.
- D. Floor Penetrations: Apply insulation continuously through floor assembly. Seal insulation with vapor-retardant mastic where floor supports penetrate vapor-retardant.
- E. Exterior Wall Penetrations: For penetrations of below-grade exterior walls, terminate insulation flush with mechanical sleeve seal. Seal terminations with vapor-retardant mastic.
- F. Hangers and Anchors: All hangers used on lines requiring insulation shall have hangers oversized and insulation support shield to allow insulation to pass continuously thru hanger.
1. Install insert materials on all piping 1 1/2" and larger. Apply insulation to tightly joint the insert. Seal insulation to insulation inserts with adhesive or sealing compound recommended by the insulation material manufacturer.
  2. Fabricate inserts of heavy density insulating material suitable for temperature. Insulation inserts shall not be less than the following lengths:

1 1/2" to 2 1/2" pipe size	10" long
3" to 6" pipe size	12" long
8" to 10" pipe size	16" long
12" and over	22" long

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3. Cover inserts with jacket material matching adjacent pipe insulation. Install shields over jacket, arranged to protect the jacket from tear or puncture by the hanger, support, and shield.
- G. Apply insulation to flanges as follows:
1. Apply preformed pipe insulation to outer diameter of pipe flange.
  2. Make width of insulation segment the same as overall width of the flange and bolts, plus twice the thickness of the pipe insulation.
  3. Fill voids between inner circumference of flange insulation and outer circumference of adjacent straight pipe segments with mineral-fiber blanket insulation.
  4. Apply jacket material with manufacturer's recommended adhesive, overlapping seams at least 2 inch (50 mm), and seal joints with vapor-retardant mastic.

END OF SECTION 20 01 80

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COMMON INSULATION FOR PLUMBING AND HVAC

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SECTION 21 10 00  
WATER-BASED FIRE-SUPPRESSION SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following fire-suppression piping inside the building:
  - 1. Wet-pipe sprinkler systems.
- B. See Division 10 Sections "Fire Extinguisher Cabinets" and "Fire Extinguishers" for cabinets and fire extinguishers.

1.2 SYSTEM DESCRIPTIONS

- A. Wet-Pipe Sprinkler System: Automatic sprinklers are attached to piping containing water and that is connected to water supply. Water discharges immediately from sprinklers when they are opened. Sprinklers open when heat melts fusible link or destroys frangible device.

1.3 GENERAL

- A. Provide all material, labor, engineering and operations for the installation of complete and operable fire suppression system as shown on the Drawings and as specified herein.
- B. Provide all equipment and materials including pipes, valves, fittings, sprinkler heads, fire department connections, backflow preventer, pipe supports, specialties and accessories necessary for a complete and approved fire suppression system.
- C. This Contractor shall be completely responsible for the design, layout, submittals, installation, testing, certification and acceptance of the fire suppression system by the Indiana Department of Homeland Security Division for Fire and Building Safety.

1.4 PERFORMANCE REQUIREMENTS

- A. Standard Piping System Component Working Pressure: Listed for at least 175 psig.
- B. Fire-suppression sprinkler system design shall be approved by authorities having jurisdiction.
  - 1. Margin of Safety for Available Water Flow and Pressure: 10 percent, including losses through water-service piping, valves, and backflow preventers.
  - 2. Sprinkler Occupancy Hazard Classifications:
    - a. Auditoriums: Ordinary Hazard, Group 1.
    - b. Building Service Areas: Ordinary Hazard, Group 1.
    - c. Classrooms: Light Hazard.
    - d. Corridors: Light Hazard.
    - e. Display Cases: Light Hazard.
    - f. Electrical Equipment Rooms: Ordinary Hazard, Group 1.
    - g. General Storage Areas: Ordinary Hazard, Group 1.
    - h. Janitors: Ordinary Hazard, Group 1.
    - i. Laundries: Ordinary Hazard, Group 1.
    - j. Libraries, Except Stack Areas: Light Hazard.
    - k. Library Stack Areas: Ordinary Hazard, Group 2.
    - l. Mechanical Equipment Rooms: Ordinary Hazard, Group 1.
    - m. Office and Public Areas: Light Hazard.
    - n. Residential Living Areas: Light Hazard.

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- o. Restaurant Service Areas: Ordinary Hazard, Group 1.
  - p. Restrooms: Light Hazard.
  - q. Stages/Stagecraft: Ordinary Hazard, Group 2.
  - r. Stairs: Light Hazard.
3. Minimum Density for Automatic-Sprinkler Piping Design:
- a. Light-Hazard Occupancy: 0.10 gpm/sq. ft. over 1500 sq. ft.
  - b. Ordinary-Hazard, Group 1 Occupancy: 0.20 gpm/sq. ft. over 2500 sq. ft.
  - c. Ordinary-Hazard, Group 2 Occupancy: 0.20 gpm/sq. ft. over 2500 sq. ft. (stage calculation should be over entire area of stage, up to max 2500 sq. ft.).
  - d. Remote area may NOT be reduced where listed quick response sprinklers are used.
4. Maximum Protection Area per Sprinkler:
- a. Light Hazard: 225 sq. ft.
  - b. Ordinary Hazard: 130 sq. ft.
  - c. Other Areas: According to NFPA 13 recommendations, unless otherwise indicated.
  - d. When using extended coverage sprinkler heads, maximum protection area per sprinkler may be increased up to 400 sq. ft. in unobstructed light hazard and ordinary hazard locations and as allowable based on hydraulic calculations.
5. Total Combined Hose-Stream Demand Requirement: According to NFPA 13, unless otherwise indicated:
- a. Light-Hazard Occupancies: 100 gpm for 30 minutes.
  - b. Ordinary-Hazard Occupancies: 250 gpm for 60 to 90 minutes.

1.5 SUBMITTALS

- A. Product Data: For each product indicated.
- B. Approved Sprinkler Piping Drawings: Working plans, prepared according to NFPA 13, that have been approved by authorities having jurisdiction, including hydraulic calculations, if applicable, and as follows:
  - 1. Areas to be sprinkled.
  - 2. Type of hazards and hazard locations.
  - 3. Type and locations of valves, drains, and test pipes.
  - 4. Alarm devices.
  - 5. Riser diagrams.
  - 6. Fire department connections.
  - 7. Location and coordination of electrical connections.
  - 8. Coordination with other trades.
  - 9. Seismic restraints.
- C. Field test reports and certificates.
- D. Field quality-control test reports.
- E. Operation and maintenance data.

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**F. Submit shop drawings to Insurance Carrier first. Then, submit approved shop drawings to the Indiana Department of Homeland Security for approval. Submit shop drawings bearing stamp of Insurance Carrier and Department of Homeland Security to the Engineer for approval.**

G. Shop Drawings must be created in a format compatible with AutoCad .dwg extension.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: Installer's responsibilities include designing, fabricating, and installing fire-suppression systems and providing professional engineering services needed to assume engineering responsibility. Base calculations on results of fire-hydrant flow test. Work shall be performed by a Sprinkler Contractor engaged in the fire suppression industry for a minimum of five (5) years.

B. Equipment Qualifications

1. Each item of equipment shall be capable of performing its function over an extended period of time with a minimum of attention and maintenance. All equipment shall be constructed using new materials designed and built in accordance with the best practices of the industry.
2. The equipment manufacturer shall have been engaged in the fire suppression industry for a minimum of five (5) years.
3. All equipment and components shall bear UL and FM label or marking and shall be FM approved for fire service.

C. NFPA Standards: Fire-suppression-system equipment, specialties, accessories, installation, and testing shall comply with the following:

1. FM, "Factory Mutual Approval Guide".
2. UL, "Underwriters Laboratory Fire Protection Equipment Directory.
3. Local Fire Department requirements.
4. Local, city, state, or any other requirements of the Authority Having Jurisdiction.
5. NFPA 13, "Installation of Sprinkler Systems"; 2010 version.
6. NFPA 13R, "Installation of Sprinkler Systems in Residential Occupancies up to and Including Four Stories in Height"; 2010 version.
7. NFPA 14, "Installation of Standpipe, Private Hydrant, and Hose Systems"; 2000 version.
8. NFPA 24, "Installation of Private Fire Service Mains and Their Appurtenances"; 1995 version.

1.7 EXTRA MATERIALS

A. For Projects requiring more than thirty (30) sprinkler heads, provide 10% extra sprinkler heads and head wrench.

B. For Projects requiring three (3) or more flow and/or tamper switches, provide 10% (or a minimum of 1) extra for each device.

C. Provide fifty (50) spare concealed sprinkler head cover plates for the Owner's future use.

1.8 IMPAIRING THE FIRE PROTECTION SYSTEM

A. Coordinate with Owner all existing fire protection systems.

B. Use the FM Global Red Tag Regulations.

C. Plan and coordinate work to minimize the period of time which the system is impaired.

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- D. In general, reactivate system at the end of each workday, under the supervision of Facilities Management. System may be left impaired overnight only if explicitly authorized by Owner.

PART 2 - PRODUCTS

2.1 PIPING MATERIALS

A. Steel Pipe and Fittings

1. Schedule 40: ASTM A53, Type E, Grade B or ASTM A135, Grade A joined by welded joints, mechanical grooved couplings, or threaded joints.
2. Schedule 10: ASTM A135, Grade A joined by welded joints, or mechanical grooved couplings.
3. The manufacturer's name or brand and applicable ASTM standard shall be marked on each length of pipe.
4. Pipe shall have a factory applied protective coating to provide resistance to microbiologically influenced corrosion (MIC).
5. Pipe grooves shall be rolled and shall be compatible with the coupling. Cut grooves are not allowed.
6. Lightwall pipe (i.e. Schedule 30 threaded, Schedule 7 grooved) is not acceptable.
7. The following pipe shall be galvanized:
  - a. Pipe exposed to weather.
  - b. Drain pipe exposed to atmosphere.
  - c. Pipe from fire department connection to check valve.
  - d. Pipe indicated on Drawings to be galvanized.
8. Cast iron threaded fittings: ASME B16.4, Class 125, standard pattern.
9. Malleable iron threaded fittings: ASME B16.3, Class 150, standard pattern.
10. Cast iron flanges: ASME 16.1, Class 125.
  - a. Gaskets shall be full face of 1/8" minimum thickness, red sheet rubber.
  - b. Flange bolts shall be hexagon head machine bolts with heavy semi-flushed hexagon head nuts, cadmium plated, with dimensions in accordance with ASME B18.2.
11. Grooved joint fittings: ASTM A536 ductile iron casting, minimum 175 psig rated pressure, with dimensions matching steel pipe.
12. Grooved pipe couplings: AWWA C606 and UL 213 rigid pattern, ductile iron housing sections, EPDM rubber gasket, 2-bolt pattern, cadmium plated bolts and nuts. Flexible and 1-bolt pattern couplings are not allowed.
13. Saddle type fittings are prohibited.

B. Hangers and Supports

1. Clevis or Band Hangers: Factory-fabricated components, NFPA approved, UL listed, or FM approved for fire-suppression piping support.
2. Hanger Rods: Continuous-thread rod, nuts, and washer made of carbon steel.
3. Trapeze Hangers: MSS SP-58, Type 59, shop- or field-fabricated pipe-support assembly, made from structural-carbon-steel shapes, with NFPA-approved, UL-listed, or FM-approved carbon-steel hanger rods, nuts, saddles, and U-bolts.



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2.2 SPRINKLER SPECIALTY FITTINGS

- A. Sprinkler specialty fittings shall be UL listed or FMG approved, with 175-psig minimum working-pressure rating, and made of materials compatible with piping.
- B. Outlet Specialty Fittings:
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Anvil International, Inc.
    - b. Central Sprinkler Corp.
    - c. National Fittings, Inc.
    - d. Star Pipe Products; Star Fittings Div.
    - e. Victaulic Co. of America.
    - f. Ward Manufacturing.
  - 2. Mechanical-T and -Cross Fittings: UL 213, ductile-iron housing with gaskets, bolts and nuts, and threaded, locking-lug, or grooved outlets.
    - a. Saddle Type fittings are prohibited.
- C. Drop-Nipple Fittings: UL 1474, adjustable with threaded inlet and outlet, and seals.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. CECA, LLC.
    - b. Merit.

2.3 SPRINKLERS

- A. Sprinklers shall be UL listed or FMG approved, with 175-psig minimum pressure rating.
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Reliable Automatic Sprinkler Co., Inc.
  - 2. Tyco International.
  - 3. Victaulic Co. of America.
  - 4. Viking Corp.
- C. Automatic Sprinklers: With heat-responsive element complying with the following:
  - 1. UL 199, for nonresidential applications.
  - 2. UL 1626, for residential applications.
  - 3. UL 1767, for early-suppression, fast-response applications.
- D. Sprinkler Types and Categories:
  - 1. Nominal 1/2-inch orifice for standard flow sprinkler head.
  - 2. Nominal 17/32-inch orifice extended coverage sprinkler head.
  - 3. "Ordinary" temperature classification rating, unless otherwise indicated or required by application.
- E. Sprinkler types, features, and options as follows:

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1. Concealed ceiling sprinklers, including cover plate.
  2. Pendent sprinklers.
  3. Quick-response sprinklers.
  4. Recessed sprinklers, including escutcheon.
  5. Sidewall sprinklers.
  6. Upright sprinklers.
  7. Dry sidewall sprinklers.
  8. Dry pendent sprinklers.
- F. Sprinkler Finishes: Chrome plated, bronze, painted, custom-color painted where indicated on Drawings.
- G. Special Coatings: Wax, lead, and corrosion-resistant paint.
- H. Sprinkler Escutcheons: Materials, types, and finishes for the following sprinkler mounting applications. Escutcheons for concealed, sidewall, and recessed-type sprinklers are specified with sprinklers.
1. Ceiling Mounting: Chrome-plated steel, 2 piece, with 1-inch vertical adjustment.
  2. Sidewall Mounting: Chrome-plated steel, one piece, flat.
- I. Sprinkler Guards: Wire-cage type when head is installed below 7'-6" or in areas subject to physical damage, including fastening device for attaching to sprinkler.
- J. Flexible Sprinkler Hose Fittings:
1. Standard: UL 1474.
  2. Type: Flexible hose for connection to sprinkler, and with manufacturer furnished bracket for connection to ceiling grid.
  3. Pressure Rating: 175-psig minimum.
  4. Size: Same as connected piping, for sprinkler.

PART 3 - EXECUTION

3.1 GENERAL

- A. Inspect preceding work. Verify all dimensions before proceeding with work and coordinate all work and placement of components with other trades.
- B. Be responsible for all measurements, fitting and assembly of all work. Prefabrication is done at the Contractor's risk.
- C. Installation
1. Drawings indicate general intent and location. Piping shall be installed in the most direct and straight manner as possible. All lines shall be run high enough to permit relocation of lights without moving ceiling grid.
  2. Coordinate exact pipe locations with Drawings and other trades before design approval and fabrication of piping. This Contractor shall be responsible for any redesign and fabrication required to fit system into allowable space.
  3. Sprinkler piping that passes through a non-sprinkled area shall be adequately protected as required by NFPA 13.
  4. Do not route any piping over electrical panels, transformers, or other equipment requiring a clear space above per NEC and NFPA Codes.

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5. All piping in finished areas shall be concealed unless shown otherwise on the Drawings.
6. All vertical lines shall be plumb and horizontal lines shall run parallel to building construction.
7. Install horizontal piping to slope to low points so that entire system may be emptied to facilitate testing.
8. Pipe drains to terminate outside the building wherever possible. Location of drains to the building exterior shall be as shown on Drawings or as approved by the Owner.
9. Pipe and fittings shall be inspected for soundness and cleaned of all dirt and other foreign matter prior to be installed. All damaged pipe and fittings will be rejected.
10. Protect open pipe ends whenever work is suspended during construction to prevent foreign material from entering.
11. Chrome plated or other polished finished components shall be installed with care so that marring does not occur to the finish.

D. Pipe Supports

1. All piping shall be supported from the structure above with UL approved hangers. Sizing, spacing, and installation shall be in accordance with NFPA 13 except as otherwise shown on the Drawings or specified herein. Comply with other sections of this specification relating to Basic Mechanical Materials and Methods for basic pipe installation.
2. Strength of Support Assemblies: Where not indicated, select sizes of components, so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 250 lb.

E. Sprinkler Heads

1. Sprinkler heads shall be installed per manufacturer's recommendations. Heads shall be installed to satisfy all code requirements for head spacing and as herein specified.
2. Finishes shall be protected against scratches, dents and discoloration. Defective items will not be acceptable.

F. Wet Sprinkler System

1. Fire sprinklers shall be provided for the entire building except as follows:
  - a. Do not install sprinkler piping or heads in elevator shafts or elevator equipment rooms.
  - b. Do not install sprinkler heads in transformer vaults.

G. Instructions

1. When required approvals of this work have been obtained, and at time designated by the Owner, demonstrate to the Owner's personnel the operation and maintenance of the systems.

3.2 PIPING SCHEDULE

A. Wet Pipe Sprinkler System

1. Pipe 1¼" and larger: Schedule 10 black-steel pipe with roll-grooved ends, grooved-end fittings for steel piping, grooved-end couplings.
2. Pipe 1" and smaller: Schedule 40 black-steel pipe with threaded ends, threaded cast iron or malleable iron fittings, threaded joints.

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3. Pipe between Fire Department Connection and check valve: Schedule 40 galvanized-steel pipe with threaded ends, galvanized threaded cast iron or malleable iron fittings, threaded joints; or roll-grooved ends, galvanized grooved-end fittings for steel pipe, grooved-end couplings.

3.3 PIPING INSTALLATION

- A. Refer to Division 20 Section "Pipe, Valves, Fittings, and Hangers for Fire Suppression, Plumbing, and HVAC" for basic piping installation.
- B. Locations and Arrangements: Drawing plans, schematics, and diagrams indicate general location and arrangement of piping. Install piping as indicated, as far as practical.
  1. Deviations from approved working plans for piping require written approval from authorities having jurisdiction. File written approval with Architect before deviating from approved working plans.
- C. Use approved fittings to make changes in direction, branch takeoffs from mains, and reductions in pipe sizes.
- D. Install unions adjacent to each valve in pipes NPS 2 and smaller. Unions are not required on flanged devices or in piping installations using grooved joints.
- E. Install flanges or flange adapters on valves, apparatus, and equipment having NPS 2-1/2 and larger connections.
- F. Install sprinkler piping with drains for complete system drainage.
- G. Hangers and Supports: Comply with NFPA 13 for hanger materials.
  1. Install standpipe system piping according to NFPA 14.
  2. Install sprinkler system piping according to NFPA 13.
- H. Fill wet-pipe sprinkler system piping with water.

3.4 JOINT INSTALLATION

- A. Install couplings, flanges, flanged fittings, unions, nipples, and transition and special fittings that have finish and pressure ratings same as or higher than system's pressure rating for aboveground applications unless otherwise indicated.
- B. Ream ends of pipes and tubes, and remove burrs. Bevel plain ends of steel pipe.
- C. Remove scale, slag, dirt, and debris from inside and outside of pipes, tubes, and fittings before assembly.
- D. Flanged Joints: Select appropriate gasket material in size, type, and thickness suitable for water service. Join flanges with gasket and bolts in accordance with ASME B31.9.
- E. Threaded Joints: Thread pipe with tapered pipe threads in accordance with ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
  1. Apply appropriate tape or thread compound to external pipe threads.
  2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged.
- F. Steel-Piping, Roll-Grooved Joints: Roll rounded-edge groove in end of pipe in accordance with AWWA C606. Assemble coupling with housing, gasket, lubricant, and bolts. Join steel pipe and grooved-end fittings in accordance with AWWA C606 for steel-pipe grooved joints.
- G. Welded Joints: Construct joints according to AWS D10.12M/D10.12, using qualified processes and welding operators according to "Quality Assurance" Article.

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1. Shop weld pipe joints where welded piping is indicated. Do not use welded joints for galvanized-steel pipe.

H. Dissimilar-Material Piping Joints: Make joints using adapters compatible with materials of both piping systems.

3.5 SPRINKLER APPLICATIONS

A. Drawings indicate sprinkler types to be used. Where specific types are not indicated, use the following sprinkler types:

1. Rooms without Ceilings: Upright sprinklers.

2. Rooms with Suspended Ceilings: Concealed sprinklers.

3. Wall Mounting: Sidewall sprinklers.

4. Sprinkler Finishes:

a. Upright Sprinklers: Rough bronze; wax coated where exposed to acids, chemicals, or other corrosive fumes.

b. Recessed Pendent, and Sidewall Sprinklers: Factory painted white, with white escutcheon.

c. Concealed Sprinklers: Rough brass, with factory-painted cover plate. Finish shall be white unless custom-color cover plate is indicated on Drawings.

d. Residential Sprinklers: Factory painted white.

3.6 SPRINKLER INSTALLATION

A. Install sprinklers in suspended ceilings in center of both dimensions of acoustical ceiling panels and tiles.

B. Do not install pendent or sidewall, wet-type sprinklers in areas subject to freezing. Use dry-type sprinklers with water supply from heated space.

3.7 CONNECTIONS

A. Drawings indicate general arrangement of piping, fittings, and specialties.

B. Install piping adjacent to equipment to allow service and maintenance.

C. Connect piping to specialty valves, hose valves, specialties, fire department connections, and accessories.

D. Ground equipment according to Division 26 Section "Grounding and Bonding for Electrical Systems."

3.8 FIELD QUALITY CONTROL

A. Perform the following field tests and inspections and prepare test reports:

1. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.

2. Flush, test, and inspect sprinkler systems according to NFPA 13, "Systems Acceptance" Chapter.

3. Flush, test, and inspect standpipe systems according to NFPA 14, "System Acceptance" Chapter.

4. Coordinate with fire alarm tests. Operate as required.

5. Verify that equipment hose threads are same as local fire department equipment.

B. Report test results promptly and in writing to Architect and authorities having jurisdiction.

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C. Sterilization

1. Contractor shall sterilize all piping upstream of fire protection backflow preventer.
  - a. Flush system thoroughly until water runs clear.
  - b. Entire system shall be filled with a water/chlorine solution containing 50 parts per million of chlorine. 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 at least 200 parts per million of chlorine and allowed to stand for three hours.
  - c. Following the allowed standing time, the system shall be flushed with clean potable water until chlorine does not remain in the water coming from the system.
  - d. After the above requirements are satisfied, submit samples to Indiana State Board of Health for approval.
  - e. Sterilization shall be redone until approval from the State Board of Health is obtained. Include copies of the approval in the Operations and Maintenance Manuals.

D. Testing

1. Testing to comply with NFPA 13 Standard.
2. Test backflow preventer to ensure proper operation. Inspection shall be performed by a registered inspector in accordance with the Indiana Department of Environmental Management. Submit reports to the Owner and include a copy in the Operations and Maintenance manuals.
3. Test all piping hydrostatically at not less than 200 psi for 2 hours without loss of pressure.
4. Retest piping that initially fails after corrective actions have been made.
5. All tests shall be made in the presence of the Owner's Representative or as directed by the Engineer. Allow for at least 24-hour notice of all tests.
6. Complete and sign "Contractor's Material and Test Certificates". Make arrangements and pay for all costs for all inspections by the authority having jurisdiction and obtain approval of the installation. Include copies of the certificates in the Operations and Maintenance Manuals.

END OF SECTION 21 10 00

SECTION 22 11 19  
DOMESTIC WATER PIPING SPECIALTIES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following domestic water piping specialties:
  - 1. Backflow preventers.
  - 2. Balancing valves.
  - 3. Strainers.
  - 4. Water hammer arresters.

1.2 PERFORMANCE REQUIREMENTS

- A. Minimum Working Pressure for Domestic Water Piping Specialties: 125 psig, unless otherwise indicated.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Field quality-control test reports.
- C. Operation and maintenance data.

1.4 QUALITY ASSURANCE

- A. NSF Compliance:
  - 1. Comply with NSF 61, "Drinking Water System Components - Health Effects; Sections 1 through 9."

PART 2 - PRODUCTS

2.1 BACKFLOW PREVENTERS

- A. Reduced-Pressure-Principle Backflow Preventers; BFP-A and BFP-B- :
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Ames Co.
    - b. Conbraco Industries, Inc.
    - c. FEBCO; SPX Valves & Controls.
    - d. Watts Industries, Inc.; Water Products Div.
    - e. Zurn Plumbing Products Group; Wilkins Div.
  - 2. Standard: ASSE 1013.
  - 3. Operation: Continuous-pressure applications.
  - 4. Capacity: Size, location, capacity, and model as indicated on Drawings.
  - 5. Body: Bronze with stainless steel trim.
  - 6. End Connections: Threaded.
  - 7. Configuration: Designed for horizontal, straight through flow.
  - 8. Relief Valve: Designed to admit air directly into the reduced pressure zone via separate channel from the water discharge.
  - 9. Accessories:
    - a. Valves: Ball type with threaded ends on inlet and outlet.

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- b. Air-Gap Fitting: ASME A112.1.2, matching backflow-preventer connection.
- c. Strainer: Bronze 'Y'-pattern strainer.

2.2 BALANCING VALVES

A. Memory-Stop Balancing Valves:

- 1. Basis-of-Design Product: Subject to compliance with requirements, provide Bell & Gossett Circuit Setter Plus or a comparable product by one of the following:
  - a. Conbraco Industries, Inc.
  - b. Crane Co.; Crane Valve Group; Crane Valves.
  - c. Hammond Valve.
  - d. Milwaukee Valve Company.
  - e. NIBCO INC.
  - f. Red-White Valve Corp.
- 2. Standard: MSS SP-110 for two-piece, copper-alloy ball valves.
- 3. Pressure Rating: 400-psig minimum CWP.
- 4. Size: Equal to pipe-size.
- 5. Body: Copper alloy with 1/4-inch NPT tapped drain/purge port.
- 6. Port: Standard or full port.
- 7. Ball: Chrome-plated brass.
- 8. Seats and Seals: Replaceable.
- 9. End Connections: Solder joint or threaded.
- 10. Handle: Vinyl-covered steel with memory-setting device. Nameplate to be calibrated to assure specific setting.
- 11. Operation: Valve to have differential pressure read-out ports across seat area and memory stop feature to allow it to be closed for service and then reopened to set point without disturbing balance position.

2.3 STRAINERS FOR DOMESTIC WATER PIPING

A. Y-Pattern Strainers:

- 1. Pressure Rating: 125 psig minimum, unless otherwise indicated.
- 2. Body: Bronze for NPS 2 and smaller; cast iron with FDA-approved interior lining complying with AWWA C550 for NPS 2-1/2 and larger.
- 3. End Connections: Threaded for NPS 2 and smaller; flanged for NPS 2-1/2 and larger.
- 4. Screen: Stainless steel with round perforations, unless otherwise indicated.
- 5. Perforation Size:
  - a. Strainers NPS 2 and Smaller: 0.020 inch.
  - b. Strainers NPS 2-1/2 to NPS 4: 0.045 inch.
  - c. Strainers NPS 5 and Larger: 0.100 inch.
- 6. Drain: Factory-installed, hose-end drain valve.



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DOMESTIC WATER PIPING SPECIALTIES

2.4 WATER HAMMER ARRESTERS

A. Water Hammer Arresters; WHA:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. AMTROL, Inc.
  - b. Josam Company.
  - c. PPP Inc.
  - d. Sioux Chief Manufacturing Company, Inc.
  - e. Smith, Jay R. Mfg. Co.; Division of Smith Industries, Inc.
  - f. Tyler Pipe; Wade Div.
  - g. Watts Drainage Products Inc.
  - h. Zurn Plumbing Products Group; Specification Drainage Operation.
2. Standard: ASSE 1010 or PDI-WH 201.
3. Type: Stainless-steel bellows with factory pressurized and sealed cushion chamber.
4. Size: ASSE 1010, Sizes AA and A through F or PDI-WH 201, Sizes A through F.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Refer to Division 20 Section "Pipe, Valves, Fittings, and Hangers for Fire Suppression, Plumbing, and HVAC" for piping joining materials, joint construction, and basic installation requirements.
- B. Install backflow preventers in each water supply to mechanical equipment and systems and to other equipment and water systems that may be sources of contamination. Comply with authorities having jurisdiction.
  1. Install drain for backflow preventers with atmospheric-vent drain connection with air-gap fitting, fixed air-gap fitting, or equivalent positive pipe separation of at least two pipe diameters in drain piping and pipe to floor drain. Locate air-gap device attached to or under backflow preventer. Simple air breaks are not acceptable for this application.
  2. Do not install bypass piping around backflow preventers.
- C. Install balancing valves in locations where they can easily be adjusted.
- D. Install Y-pattern strainers for water on supply side of each control valve, water pressure-reducing valve, solenoid valve, and pump.
- E. Install water hammer arresters in water piping as follows:
  1. In accordance to PDI-WH 201.
  2. In upright position.
  3. At any fixture having quick-closing valves.
  4. In an accessible location. Provide access panels as required. Coordinate with Architectural Drawings.
- F. Piping installation requirements are specified in other Division 20 Sections. Drawings indicate general arrangement of piping and specialties.

3.2 FIELD QUALITY CONTROL

- A. Perform the following tests and prepare test reports:

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DOMESTIC WATER PIPING SPECIALTIES

1. Test each reduced-pressure-principle backflow preventer according to authorities having jurisdiction and the device's reference standard.
  - B. Test domestic water piping specialties under pressure. Refer to Division 20 Section "Pipe, Valves, Fittings, and Hangers for Fire Suppression, Plumbing, and HVAC" for pressure test requirements.
  - C. Remove and replace malfunctioning domestic water piping specialties and retest as specified above.
- 3.3 ADJUSTING
- A. Set field-adjustable pressure set points of water pressure-reducing valves. Refer to Plumbing Equipment Schedule on Drawings for set points.

END OF SECTION 22 11 19

SECTION 22 13 19  
SANITARY WASTE PIPING SPECIALTIES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following sanitary drainage piping specialties:
1. Cleanouts.
  2. Floor drains.
  3. Miscellaneous sanitary drainage piping specialties.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated. Include rated capacities, operating characteristics, and accessories for grease interceptors.

1.3 QUALITY ASSURANCE

- A. Drainage piping specialties shall bear label, stamp, or other markings of specified testing agency.

PART 2 - PRODUCTS

2.1 CLEANOUTS

- A. Cleanouts for Vinyl Tile Floor:
1. Basis-of-Design Product: Subject to compliance with requirements, provide Jay R. Smith 4141S or a comparable product by one of the following:
    - a. Josam Company; Josam Div.
    - b. MIFAB, Inc.
    - c. Tyler Pipe; Wade Div.
    - d. Watts Drainage Products Inc.
    - e. Zurn Plumbing Products Group; Specification Drainage Operation.
  2. Standard: ASME A112.36.2M.
  3. Size: Same as connected branch.
  4. Body or Ferrule: Cast iron
  5. Outlet Connection: Spigot.
  6. Closure: Bronze plug with straight threads and gasket.
  7. Adjustable Housing Material: Cast iron with threads.
  8. Frame and Cover Material and Finish: Nickel-bronze with 1/8-inch tile recess.
  9. Frame and Cover Shape: Round.
  10. Top Loading Classification: Light duty.
- B. Cleanouts for Concrete Floor:
1. Basis-of-Design Product: Subject to compliance with requirements, provide Jay R. Smith 4101S or a comparable product by one of the following:
    - a. Josam Company; Josam Div.
    - b. MIFAB, Inc.
    - c. Tyler Pipe; Wade Div.
    - d. Watts Drainage Products Inc.

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SANITARY WASTE PIPING SPECIALTIES

- e. Zurn Plumbing Products Group; Specification Drainage Operation.
- 2. Standard: ASME A112.36.2M.
- 3. Size: Same as connected branch.
- 4. Body or Ferrule: Cast iron
- 5. Outlet Connection: Spigot.
- 6. Closure: Bronze plug with straight threads and gasket.
- 7. Adjustable Housing Material: Cast iron with setscrews.
- 8. Frame and Cover Material and Finish: Scoriated nickel-bronze.
- 9. Frame and Cover Shape: Round.
- 10. Top Loading Classification: Extra heavy duty.

C. Wall Cleanouts:

- 1. Basis-of-Design Product: Subject to compliance with requirements, provide Jay R. Smith 4531S-Y or a comparable product by one of the following:
  - a. Josam Company; Josam Div.
  - b. MIFAB, Inc.
  - c. Tyler Pipe; Wade Div.
  - d. Watts Drainage Products Inc.
  - e. Zurn Plumbing Products Group; Specification Drainage Operation.
- 2. Standard: ASME A112.36.2M.
- 3. Size: Same as connected drainage piping.
- 4. Body: Hub-less, cast-iron soil pipe test tee as required to match connected piping.
- 5. Closure: Countersunk, drilled-and-threaded bronze plug.
- 6. Closure Plug Size: Same as or not more than one size smaller than cleanout size.

2.2 FLOOR DRAINS

A. Cast-Iron Floor Drains; FD-1 :

- 1. Basis-of-Design Product: Subject to compliance with requirements, provide Jay R. Smith 2005Y-A or a comparable product by one of the following:
  - a. Josam Company; Josam Div.
  - b. MIFAB, Inc.
  - c. Tyler Pipe; Wade Div.
  - d. Watts Drainage Products Inc.
  - e. Zurn Plumbing Products Group; Light Commercial Operation.
- 2. Standard: ASME A112.6.3.
- 3. Pattern: Floor drain.
- 4. Body Material: Gray iron.
- 5. Seepage Flange: Combination flashing collar and clamp with seepage openings.
- 6. Outlet: Bottom, no-hub.

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SANITARY WASTE PIPING SPECIALTIES

7. Coating on Interior and Exposed Exterior Surfaces: Not required.
8. Sediment Bucket: Not required.
9. Top or Strainer Material: Nickel bronze.
10. Top Description: Adjustable, round, heel-proof, flat.
11. Top Loading Classification: Light Duty.

2.3 MISCELLANEOUS SANITARY DRAINAGE PIPING SPECIALTIES

A. Deep-Seal Traps:

1. Description: Cast-iron or bronze casting, with inlet and outlet matching connected piping and cleanout trap-seal primer valve connection.
2. Size: Same as connected waste piping.
  - a. NPS 2: 4-inch minimum water seal.
  - b. NPS 2-1/2 and Larger: 5-inch minimum water seal.

B. Air-Gap Fittings:

1. Standard: ASME A112.1.2, for fitting designed to ensure fixed, positive air gap between installed inlet and outlet piping.
2. Body: Bronze or cast iron.
3. Inlet: Opening in top of body.
4. Outlet: Larger than inlet.
5. Size: Same as connected waste piping and with inlet large enough for associated indirect waste piping.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Refer to Division 20 Section "Pipe, Valves, Fittings, and Hangers for Fire Suppression, Plumbing, and HVAC" for piping joining materials, joint construction, and basic installation requirements.
- B. Install cleanouts in aboveground piping and building drain piping according to the following, unless otherwise indicated:
  1. Size same as drainage piping up to NPS 4. Use NPS 4 for larger drainage piping unless larger cleanout is indicated.
  2. Locate at each change in direction of piping greater than 45 degrees.
  3. Locate at minimum intervals of 50 feet for piping NPS 4 and smaller and 100 feet for larger piping.
  4. Locate at base of each vertical soil and waste stack.
- C. For floor cleanouts for piping below floors, install cleanout deck plates with top flush with finished floor.
- D. For cleanouts located in concealed piping, install cleanout wall access covers, of types indicated, with frame and cover flush with finished wall.
- E. Install floor drains at low points of surface areas to be drained. Set grates of drains flush with finished floor, unless otherwise indicated.
  1. Position floor drains for easy access and maintenance.

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SANITARY WASTE PIPING SPECIALTIES

2. Set floor drains below elevation of surrounding finished floor to allow floor drainage. Set with grates depressed according to the following drainage area radii:
    - a. Radius, 30 Inches or Less: Equivalent to 1 percent slope, but not less than 1/4-inch total depression.
    - b. Radius, 30 to 60 Inches: Equivalent to 1 percent slope.
    - c. Radius, 60 Inches or Larger: Equivalent to 1 percent slope, but not greater than 1-inch total depression.
  3. Install floor-drain flashing collar or flange so no leakage occurs between drain and adjoining flooring. Maintain integrity of waterproof membranes where penetrated.
  4. Install individual traps for floor drains connected to sanitary building drain, unless otherwise indicated.
- F. Assemble open drain fittings and install with top of hub 2 inches above floor.
- G. Install deep-seal traps on floor drains and other waste outlets, if indicated.
- H. Install air-gap fittings on draining-type backflow preventers and on indirect-waste piping discharge into sanitary drainage system.
- I. Install traps on plumbing specialty drain outlets. Omit traps on indirect wastes unless trap is indicated.
- 3.2 CONNECTIONS
- A. Piping installation requirements are specified in other Division 20 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.
  - B. Install piping adjacent to equipment to allow service and maintenance.
- 3.3 PROTECTION
- A. Protect drains during remainder of construction period to avoid clogging with dirt or debris and to prevent damage from traffic or construction work.
  - B. Place plugs in ends of uncompleted piping at end of each day or when work stops.

END OF SECTION 22 13 19

SECTION 22 40 00  
PLUMBING FIXTURES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
  - 1. Faucets.
  - 2. Flushometers.
  - 3. Toilet seats.
  - 4. Protective shielding guards.
  - 5. Fixture supports.
  - 6. Water closets.
  - 7. Urinals.
  - 8. Lavatories.
  - 9. Sinks.
  - 10. Clothes washer boxes.
- B. Related Sections include the following:
  - 1. Division 22 Section "Drinking Fountains and Water Coolers."

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Diagram power, signal, and control wiring.
- C. Operation and maintenance data.

1.3 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Regulatory Requirements: Comply with requirements in ICC A117.1, "Accessible and Usable Buildings and Facilities"; Public Law 90-480, "Architectural Barriers Act"; and Public Law 101-336, "Americans with Disabilities Act"; for plumbing fixtures for people with disabilities.
- C. Regulatory Requirements: Comply with requirements in Public Law 102-486, "Energy Policy Act," about water flow and consumption rates for plumbing fixtures.
- D. NSF Standard: Comply with the latest adopted version of NSF 61, "Drinking Water System Components--Health Effects," for fixture materials that will be in contact with potable water.
- E. Select combinations of fixtures and trim, faucets, fittings, and other components that are compatible.
- F. Comply with the following applicable standards and other requirements specified for plumbing fixtures:
  - 1. Vitreous-China Fixtures: ASME A112.19.2M.
  - 2. Water-Closet, Flush Valve Trim: ASME A112.19.5.
- G. Comply with the following applicable standards and other requirements specified for lavatory/sink faucets:
  - 1. Backflow Protection Devices for Faucets with Hose-Thread Outlet: ASME A112.18.3M.

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2. Faucets: ASME A112.18.1.
  3. NSF Potable-Water Materials: NSF 61.
  4. Sensor-Actuated Faucets and Electrical Devices: UL 1951.
- H. Comply with the following applicable standards and other requirements specified for miscellaneous fittings:
1. Atmospheric Vacuum Breakers: ASSE 1001.
  2. Brass and Copper Supplies: ASME A112.18.1.
  3. Brass Waste Fittings: ASME A112.18.2.
  4. Manual-Operation Flushometers: ASSE 1037.
  5. Plastic Tubular Fittings: ASTM F 409.
  6. Sensor-Operation Flushometers: ASSE 1037 and UL 1951.
  7. Supply Fittings: ASME A112.18.1.
- I. Comply with the following applicable standards and other requirements specified for miscellaneous components:
1. Flexible Water Connectors: ASME A112.18.6.
  2. Grab Bars: ASTM F 446.
  3. Hose-Coupling Threads: ASME B1.20.7.
  4. Off-Floor Fixture Supports: ASME A112.6.1M.
  5. Pipe Threads: ASME B1.20.1.
  6. Plastic Toilet Seats: ANSI Z124.5.
  7. Supply and Drain Protective Shielding Guards: ICC A117.1.

PART 2 - PRODUCTS

2.1 FLUSH VALVE WATER CLOSETS

A. Water Closets; WC-1 and WC-2 :

1. Basis-of-Design Product: Subject to compliance with requirements, provide American Standard "Afwall FloWise" 2257.001, or a comparable by the following:
  - a. Kohler Co.
  - b. Sloan.
  - c. Zurn Plumbing Products Group.
2. Description: Wall-mounting, back-outlet, vitreous-china fixture designed for flushometer valve operation.
  - a. Style: Flushometer valve.
  - b. Bowl Type: Elongated with siphon-jet design.
  - c. Height: Refer to the plumbing fixture schedule on the Drawings.
  - d. Design Consumption: 1.28 gal./flush.
  - e. Color: White.

2.2 WATER CLOSET FLUSHOMETERS

A. Water Closet; WC-1 and WC-2 :



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PLUMBING FIXTURES

1. Basis-of-Design Product: Subject to compliance with requirements, provide Sloan Solis 8111-1.28, or a comparable by the following:
  - a. Zurn Plumbing Products Group; Commercial Brass Operation.
2. Description: Flushometer for water-closet type fixture. Include brass body with corrosion and chlorine resistant internal components, dual-filtered bypass, synthetic rubber diaphragm assembly, control stop with check valve, vacuum breaker, copper or brass tubing, and polished chrome-plated finish on exposed parts.
  - a. Internal Design: Diaphragm operation.
  - b. Style: Exposed.
  - c. Inlet Size: NPS 1.
  - d. Trip Mechanism: Solar powered, infrared sensor actuator, alkaline battery back-up.
  - e. Consumption: 1.28 gal./flush.
  - f. Tailpiece Size: NPS 1-1/2 and standard length to top of bowl.

2.3 FIXTURE SUPPORTS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  1. Josam Company.
  2. Smith, Jay R. Mfg. Co.
  3. Tyler Pipe; Wade Div.
  4. Watts Drainage Products Inc.; a div. of Watts Industries, Inc.
  5. Zurn Plumbing Products Group; Specification Drainage Operation.
- B. Water-Closet Supports; WC-1 and WC-2 :
  1. Description: Combination carrier designed for accessible and standard mounting height of wall-mounting, water-closet-type fixture. Include single or double, vertical or horizontal, hub-less waste fitting as required for piping arrangement; faceplates; couplings with gaskets; feet; and fixture bolts and hardware matching fixture. Include additional extension coupling, faceplate, and feet for installation in wide pipe space.

2.4 TOILET SEATS

- A. Toilet Seats; WC-1 and WC-2 :
  1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Bemis Manufacturing Company.
    - b. Church Seats.
    - c. Olsonite Corp.
  2. Description: Toilet seat for water-closet-type fixture.
    - a. Material: Molded, solid plastic.
    - b. Configuration: Open front less cover.
    - c. Size: Elongated.
    - d. Hinge Type: Stainless steel, self-sustaining check hinge.

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- e. Class: Extra heavy-duty, commercial.
- f. Color: White.

2.5 URINALS

A. Urinals; UR-1 and UR-2 :

1. Basis-of-Design Product: Subject to compliance with requirements, provide American Standard "Washbrook FloWise" 6590.001 or a comparable product by one of the following:
  - a. Kohler Co.
  - b. Sloan.
  - c. Zurn Plumbing Products Group.
2. Description: Wall-mounting, back-outlet, vitreous-china fixture designed for flushometer valve operation.
  - a. Type: Washout.
  - b. Strainer or Trapway: Stainless steel strainer with integral trap.
  - c. Design Consumption: 0.5 gal./flush.
  - d. Color: White.
  - e. Supply Spud Size: NPS 3/4.
  - f. Outlet Size: NPS 2.

2.6 URINAL FLUSHOMETERS

A. Urinal; UR-1 and UR-2 :

1. Basis-of-Design Product: Subject to compliance with requirements, provide Sloan Solis 8186-0.125, or a comparable product by one of the following:
  - a. Zurn Plumbing Products Group; Commercial Brass Operation.
2. Description: Flushometer for urinal type fixture. Include brass body with corrosion and chlorine resistant internal components, dual-filtered bypass, synthetic rubber diaphragm assembly, control stop with check valve, vacuum breaker, copper or brass tubing, and polished chrome-plated finish on exposed parts.
  - a. Internal Design: Diaphragm operation.
  - b. Style: Exposed.
  - c. Inlet Size: NPS 3/4.
  - d. Trip Mechanism: Solar powered, infrared-sensor actuator.
  - e. Consumption: 0.125 gal./flush.
  - f. Tailpiece Size: NPS 3/4 and standard length to top of bowl.

2.7 FIXTURE SUPPORTS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Josam Company.
  2. Smith, Jay R. Mfg. Co.
  3. Tyler Pipe; Wade Div.
  4. Watts Drainage Products Inc.; a div. of Watts Industries, Inc.

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5. Zurn Plumbing Products Group; Specification Drainage Operation.

B. Urinal Supports; UR-1 and UR-2 :

1. Description: Type I, urinal carrier with fixture support plates and coupling with seal and fixture bolts and hardware matching fixture for wall-mounting, urinal-type fixture. Include steel uprights with feet.

2.8 LAVATORIES

A. Lavatories; L-1 :

1. Basis-of-Design Product: Subject to compliance with requirements, provide American Standard "Ovalyn" 0496.221 or a comparable product by one of the following:

- a. Kohler Co.
- b. Sloan.
- c. Zurn Plumbing Products Group.

2. Description: Under-counter mounting, vitreous-china fixture.

- a. Size: 19-1/4 by 16-1/4 inches rim, 17 by 16-1/4 inches oval bowl.
- b. Color: White.
- c. Finish: Unglazed rim.

3. Subject to compliance with requirements, provide trim products by one of the following:

- a. McGuire Manufacturing Company.
- b. Engineered Brass Company.
- c. Keeney Manufacturing Company.

4. Lavatory Trim

- a. Supplies: Chrome-plated copper with 1/2" NPT x 3/8" OD loose key stops.
- b. Drain: Grid with ADA compliant offset waste.
- c. Drain Piping: NPS 1-1/4 chrome-plated cast-brass P-trap with cleanout; NPS 1-1/4 17-gauge tubular brass waste to wall; and wall escutcheon.

2.9 LAVATORY FAUCETS

A. Lavatory Faucets; L-1 :

1. Basis-of-Design Product: Subject to compliance with requirements, provide Sloan EFX-275-4-SOL-ISM-CP-0.5GPM-MLM-IR-FCT, or an approved equal:

2. Description: Sensor-control mixing valve. Coordinate faucet inlets with supplies and fixture holes; coordinate outlet with spout and fixture receptor.

- a. Body Material: Commercial, solid brass.
- b. Finish: Polished chrome plate.
- c. Maximum Flow Rate: 0.5 gpm.
- d. Centers: Single hole with 4-inch deck plate.
- e. Mounting: Deck, exposed.
- f. Inlet(s): NPS 3/8 tubing, with NPS 1/2 male adaptor.
- g. Spout Outlet: Aerator.

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- h. Power Source: Integral solar panel.
- i. Temperature Control: Internal mixer.
- j. Warranty: 3-year limited.

2.10 PROTECTIVE SHIELDING GUARDS

A. Protective Shielding Pipe Covers; L-1 :

- 1. Basis-of-Design Product: Subject to compliance with requirements, provide Truebro 103 E-Z or a comparable product by one of the following:
  - a. Insul-Tect Products Co.; a Subsidiary of MVG Molded Products.
  - b. Plumberex Specialty Products Inc.
- 2. Description: Manufactured plastic wraps for covering plumbing fixture hot and cold-water supplies and trap and drain piping. Comply with Americans with Disabilities Act (ADA) requirements.
  - a. Material: Molded vinyl.
  - b. Nominal Thickness: 1/8" constant wall.
  - c. UV Protection: Required.
  - d. Fasteners: Internal, reusable fasteners.
  - e. Color: White.

2.11 FIXTURE SUPPORTS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- 1. Josam Company.
- 2. Smith, Jay R. Mfg. Co.
- 3. Tyler Pipe; Wade Div.
- 4. Watts Drainage Products Inc.; a div. of Watts Industries, Inc.
- 5. Zurn Plumbing Products Group; Specification Drainage Operation.

B. Lavatory Supports; L- :

- 1. Description: Type II, lavatory carrier with concealed arms and tie rod for wall-mounting, lavatory-type fixture. Include steel uprights with feet.

2.12 LAUNDRY TUBS

A. Laundry Tubs; LT-1 :

- 1. Basis-of-Design Product: Subject to compliance with requirements, provide Fiat L-1 or a comparable product by one of the following:
  - a. Swan.
  - b. Stern-Williams.
- 2. Description: One-bowl, wall-mounting, molded stone utility tub.
  - a. Overall Dimensions: 23 by 21 by 13-7/16 inches.
  - b. Faucet Hole Punching: Two holes, 4-inch centers.
  - c. Mounting: Wall mounting bracket.

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3. Subject to compliance with requirements, provide trim products by one of the following:
  - a. McGuire Manufacturing Company.
  - b. Engineered Brass Company.
  - c. Keeney Manufacturing Company.
4. Sink Trim
  - a. Drain: Chrome plated brass tray plug with rubber stopper and chain.
  - b. Supplies: Chrome-plated copper with 1/2" NPT x 3/8" OD loose key stops.
  - c. Drain Piping: NPS 1-1/2 chrome-plated cast-brass P-trap with cleanout; NPS 1-1/2 17-gauge tubular brass waste to wall; and wall escutcheon(s).

2.13 LAUNDRY TUB FAUCETS

A. Laundry Tub Faucets; LT-1 :

1. Basis-of-Design Product: Subject to compliance with requirements, provide American Standard 2475.540, or a comparable by the following:
  - a. Zurn Plumbing Products Group; Commercial Brass Operation.
2. Description: Manual-control mixing valve with double bend spout. Coordinate faucet inlets with supplies and fixture holes; coordinate outlet with spout and fixture receptor.
  - a. Body Material: Commercial, solid brass.
  - b. Finish: Polished chrome plate.
  - c. Mixing Valve: Two handle.
  - d. Centers: 4 inches.
  - e. Mounting: Deck, exposed.
  - f. Handle(s): Lever.
  - g. Inlet(s): NPS 1/2 male shank.
  - h. Spout Type: Swing, solid brass.
  - i. Spout Outlet: Aerator.
  - j. Operation: Ceramic, manual.

2.14 CLOTHES WASHER BOXES

A. Washer Boxes; WB-1 :

1. Basis-of-Design Product: Subject to compliance with requirements, provide Guy Gray 82158 or a comparable product by one of the following:
  - a. Acorn Engineering Company.
  - b. Oatey.
2. Description: Recessed wall-mounting water supply box.
  - a. Overall dimension: 8-1/4 by 5-5/8 by 3-1/2 inches.
  - b. Metal Thickness: 20 gauge cold rolled steel.
  - c. Supplies: 1/2" sweat inlet.
  - d. Valve: Integral hammer arrester quarter turn, 1/2" O.D. outlet.
  - e. Drain: 2" slipnut drain kit.

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- f. Finish: White powder coat.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Assemble plumbing fixtures, trim, fittings, and other components according to manufacturers' written instructions.
- B. Install off-floor supports, affixed to building substrate, for wall-mounting fixtures.
  - 1. Use carrier supports with waste fitting and seal for back-outlet fixtures.
  - 2. Use carrier supports without waste fitting for fixtures with tubular waste piping.
- C. Install wall-mounting fixtures with tubular waste piping attached to supports.
- D. Install fixtures level and plumb according to roughing-in drawings.
- E. Install water-supply piping with stop on each supply to each fixture to be connected to water distribution piping. Attach supplies to supports or substrate within pipe spaces behind fixtures. Install stops in locations where they can be easily reached for operation. All exposed supply piping shall be chrome-plated copper.
- F. Install trap and tubular waste piping on drain outlet of each fixture to be directly connected to sanitary drainage system.
- G. Install tubular waste piping on drain outlet of each fixture to be indirectly connected to drainage system.
- H. Install flushometer valves for accessible water closets and urinals with handle mounted on wide side of compartment. Install other actuators in locations that are easy for people with disabilities to reach.
- I. Install tanks for accessible, tank-type water closets with lever handle mounted on wide side of compartment.
- J. Install toilet seats on water closets.
- K. Install traps on fixture outlets.
  - 1. Exception: Omit trap on fixtures with integral traps.
  - 2. Exception: Omit trap on indirect wastes, unless otherwise indicated.
- L. Connect drain outlet hose from dishwasher to drain connection on disposer.
- M. Install escutcheons at piping wall and ceiling penetrations in exposed, finished locations and within cabinets and millwork. Use deep-pattern escutcheons if required to conceal protruding fittings. Escutcheons are specified in Division 20 Section "Common Work Materials and Methods for Fire Suppression, Plumbing, and HVAC."
- N. Seal joints between fixtures and walls, floors, and countertops using sanitary-type, one-part, mildew-resistant silicone sealant. Match sealant color to fixture color. Sealants are specified in Division 07 Section "Joint Sealants."

3.2 CONNECTIONS

- A. Piping installation requirements are specified in other Division 20 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Connect fixtures with water supplies, stops, and risers, and with traps, soil, waste, and vent piping. Use size fittings required to match fixtures.
- C. Ground equipment according to Division 26 Section "Grounding and Bonding for Electrical Systems."

SECTION 22 40 00  
PLUMBING FIXTURES

- D. Connect wiring according to Division 26 Section "Low-Voltage Electrical Power Conductors and Cables."

3.3 FIELD QUALITY CONTROL

- A. Verify that installed plumbing fixtures are categories and types specified for locations where installed.
- B. Check that plumbing fixtures are complete with trim, faucets, fittings, and other specified components.
- C. Inspect installed plumbing fixtures for damage. Replace damaged fixtures and components.
- D. Test installed fixtures after water systems are pressurized for proper operation. Replace malfunctioning fixtures and components, then retest. Repeat procedure until units operate properly.
- E. Install fresh batteries in sensor-operated mechanisms.

3.4 PROTECTION

- A. Provide protective covering for installed fixtures and fittings.
- B. Do not allow use of plumbing fixtures for temporary facilities unless approved in writing by Owner.

END OF SECTION 22 40 00

SECTION 22 40 00  
PLUMBING FIXTURES

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SECTION 22 47 00  
DRINKING FOUNTAINS AND WATER COOLERS

PART 1 - GENERAL

1.1 SUMMARY – ALTERNATE BID

- A. This Section includes the following:
  - 1. Type PB, pressure with bubbler, Style W, wall-mounting water coolers.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Diagram power, signal, and control wiring.
- C. Operation and maintenance data.

1.3 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Regulatory Requirements: Comply with requirements in ICC A117.1, "Accessible and Usable Buildings and Facilities"; Public Law 90-480, "Architectural Barriers Act"; and Public Law 101-336, "Americans with Disabilities Act"; for fixtures for people with disabilities.
- C. NSF Standard: Comply with NSF 61, "Drinking Water System Components--Health Effects," for fixture materials that will be in contact with potable water.
- D. ARI Standard: Comply with ARI 1010, "Self-Contained, Mechanically Refrigerated Drinking-Water Coolers," for water coolers and with ARI's "Directory of Certified Drinking Water Coolers" for type and style classifications.
- E. ASHRAE Standard: Comply with ASHRAE 34, "Designation and Safety Classification of Refrigerants" for water coolers. Provide HFC 134a (tetrafluoroethane) refrigerant unless otherwise indicated.

PART 2 - PRODUCTS

2.1 PRESSURE WATER COOLERS

- A. Water Coolers; EWC-1 :
  - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Halsey Taylor HTHB-HAC8WF, or an approved equal.
  - 2. Description: Accessible, ARI 1010, Type PB, pressure with bubbler, Style W, wall-mounting water cooler.
    - a. Cabinet: Single cabinet, vinyl coated steel with stainless-steel top, HydroBoost bottle filling station.
    - b. Color: As selected by Architect.
    - c. Bubbler: One, adjustable stream regulator, located on cabinet deck.
    - d. Control: Push pad.
    - e. Filter: One installed water filter complying with NSF 42 and NSF 53 for cyst and lead reduction to below EPA standards; with capacity sized for unit peak flow rate.
    - f. Cooling System: Electric, with hermetically sealed compressor, cooling coil, air-cooled condensing unit, corrosion-resistant tubing, refrigerant, corrosion-resistant-metal storage tank, and adjustable thermostat.
      - 1) Capacity: 8 gph of 50 deg F cooled water from 80 deg F inlet water and 90 deg F ambient air temperature.

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DRINKING FOUNTAINS AND WATER COOLERS

- 2) Electrical Characteristics: 1/4 hp; 120-V ac; single phase; 60 Hz.
- g. HydroBoost Bottle Filling Station
  - 1) Description: Sensor-activated enhanced with user interface graphics.
  - 2) Quick-fill rate: 1.1 gpm with laminar flow.
  - 3) Green Counter: Visually displays count of plastic bottles saved from landfills.
- h. Support: Manufacturer furnished wall mounting bracket and hardware.
- i. Accessories:
  - 1) Provide additional cartridge filter for each installed unit.
- 3. Subject to compliance with requirements, provide trim products by one of the following:
  - a. McGuire Manufacturing Company.
  - b. Engineered Brass Company.
  - c. Keeney Manufacturing Company.
- 4. Water Cooler Trim
  - a. Supplies: Chrome-plated copper with 1/2" NPT x 3/8" OD loose key stops.
  - b. Drain: Grid with NPS 1-1/4 horizontal waste and trap complying with ASME A112.18.1. NPS 1-1/4 chrome-plated cast-brass P-trap with cleanout; NPS 1-1/4 17-gauge tubular brass waste to wall; and wall escutcheon.

PART 3 - EXECUTION

3.1 APPLICATIONS

- A. Use carrier off-floor supports for wall-mounting fixtures, unless otherwise indicated.
- B. Use chrome-plated brass or copper tube, fittings, and valves in locations exposed to view.

3.2 INSTALLATION

- A. Install off-floor supports affixed to building substrate and attach wall-mounting fixtures, unless otherwise indicated.
- B. Install fixtures level and plumb. For fixtures indicated for children, install at height required by authorities having jurisdiction.
- C. Install water-supply piping with shutoff valve on supply to each fixture to be connected to water distribution piping. Install valves in locations where they can be easily reached for operation. Valves are specified in Division 20 Section "Pipe, Valves, Fittings, and Hangers for Fire Suppression, Plumbing, and HVAC."
- D. Install trap and waste piping on drain outlet of each fixture to be connected to sanitary drainage system.
- E. Seal joints between fixtures and walls and floors using sanitary-type, one-part, mildew-resistant, silicone sealant. Match sealant color to fixture color. Sealants are specified in Division 07 Section "Joint Sealants."
- F. Turn over spare supply of water filters (for each unit installed) to Owner.

3.3 CONNECTIONS

- A. Connect fixtures with water supplies, traps, and risers, and with soil, waste, and vent piping. Use size fittings required to match fixtures.

SECTION 22 47 00  
DRINKING FOUNTAINS AND WATER COOLERS

- B. Ground equipment according to Division 26 Section "Grounding and Bonding for Electrical Systems."
- C. Connect wiring according to Division 26 Section "Low-Voltage Electrical Power Conductors and Cables."

3.4 FIELD QUALITY CONTROL

- A. Water Cooler Testing: After electrical circuitry has been energized, test for compliance with requirements. Test and adjust controls and safeties.
  - 1. Remove and replace malfunctioning units and retest as specified above.
  - 2. Report test results in writing.

3.5 ADJUSTING

- A. Adjust fixture flow regulators for proper flow and stream height.
- B. Adjust water cooler temperature settings.

END OF SECTION 22 47 00

SECTION 22 47 00  
DRINKING FOUNTAINS AND WATER COOLERS

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SECTION 23 05 93  
TESTING AND BALANCING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes testing, adjusting and balancing of HVAC Systems to produce design objectives, including the following:
1. Adjusting blowers, fans and ducts to deliver or exhaust design air flow.
  2. Adjusting terminal units, diffusers, registers and grilles to supply, return or exhaust design air flow.
  3. Adjusting relief dampers and vents.
  4. Adjusting diffusers, registers and grilles to minimize drafts.
  5. Adjusting all zones for design supply and return air flow.
  6. Adjusting blowers and fans to design rpm.
  7. Balancing of heating water, cooling water, and condenser water systems to achieve design flow characteristics.
  8. Adjusting VAV terminal box controllers to design cfm. (Heating and Cooling).
  9. Sheet metal shop drawing review prior to ductwork installation, review the Sheet Metal Contractor's duct fabrication drawings and mark any additional balancing dampers, etc. that are required for proper balancing of the systems. This Contractor shall receive two copies from the Sheet Metal Contractor and shall return one copy to Sheet Metal Contractor.

1.3 SUBMITTALS

- A. Bidding Documents
1. If so requested on the bid form Submit name of the Test and Balance Agency to Architect/Engineer as a subcontractor on the Materials and Subcontractors Listing.
  2. If the Contractor fails to submit name of selected Test and Balance Agency, the Architect/Engineer will select the agency of his choice and Contractor must then issue purchase order for this work as directed.
- B. Certificate: Selected and approved agency shall submit certificate immediately upon receipt of test and balance contract.
- C. Data Sheets
1. Submit type written data sheets on each item of testing equipment to be used.
  2. Include name of device, manufacturer's name, model number, latest date of calibration and correction factors.
- D. Report Forms
1. Submit 30, 60, 90 percent site visit reports on installation of HVAC systems.
  2. Forms shall be 8-1/2" x 11", with blanks for listing of the required test ratings and for certification of report.
  3. Submit preliminary pencil copies of reports as A/E determines.
- E. Final Report

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1. Upon completion, all information shall be neatly typed, PDF'd, and electronically submitted to the Architect/Engineer with accompanying schematic diagrams of systems tested.
2. All test reports shall be submitted with project name and Balancing Contractor's name printed thereon.
3. A copy of the report shall be incorporated into the O&M manual for the project as a dedicated section.

1.4 QUALITY ASSURANCE

A. Test and Balance Agency

1. Obtain the services of an independent Test and Balance Agency that specializes in, and whose business is limited to, the testing and balancing of air conditioning systems.
2. The agency selected shall be fully certified by the NEBB and shall have at least one member of the agency qualified as a certified test and balance Engineer who has been issued this certification by the National Examining Board.
3. All work shall be done under the direct supervision of a full time member of the organization.
4. All final reports shall be signed and sealed by the certified test and balance Engineer.
5. Approved Test and Balance Contractors:
  - a. Total Balance
  - b. Gibson Services.
  - c. Bledsoe Test and Balance
  - d. Technical Systems Group – Terre Haute
6. Agency Contract: Award the contract to the approved Balance Contractor in sufficient time to allow the Test and Balance Contractor to schedule this work in cooperation with other trades involved and comply with the completion date.

B. Instruments

1. The minimum instrumentation for testing, adjusting and balancing shall be the "NEBB Approved Minimum Field Instrumentation."
2. Instruments used for testing and balancing must have been calibrated within a period of six months and checked for accuracy prior to start of work.
3. Instruments must be maintained and carried in such manner to protect them from excessive vibration and moisture conditions.
4. Approval: all products and instrumentation used shall be subject to approval of the Engineer.

C. Procedure - Methodology: testing and balancing shall be performed in complete accordance with NEBB National Standards for Field Measurements and Instrumentation.

D. Conditions: System Operation - heating, ventilating, and air conditioning equipment including filters, shall be completely installed and in continuous operation as required to accomplish the adjusting and balance work specified. Test and Balance Agency shall give a Check List to the Mechanical and/or Sheet Metal Contractors which, when completed, and returned, will assure the systems are ready to be balanced. A/E shall receive a copy of check list from Mechanical and Sheet Metal Contractors when completed.

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1.5 COORDINATION

- A. Coordinate the efforts of factory-authorized service representatives for systems and equipment, HVAC controls installers, and other mechanics to operate HVAC systems and equipment to support and assist testing, adjusting, and balancing activities.
- B. Notice: Provide seven (7) days advance notice for each test. Include scheduled test date and times.
- C. Perform testing, adjusting, and balancing after leakage and pressure tests on air and water distribution systems have been satisfactorily completed.
- D. Measurements – Readjustments
  - 1. Should corrective measures caused by faulty installation require retesting, adjusting and balancing, such work shall be at no additional expense.
  - 2. Corrective measures other than the above shall be made only as directed by the Architect/Engineer. Such work shall be at no additional expense.

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION

3.1 PREPARATION

- A. Air Systems - prior to system testing and balancing
  - 1. Verify that the appropriate contractor has:
    - a. Checked all systems and placed them into a fully operational status.
    - b. Installed clean filters within the equipment. Do not continue testing of unit until clean filters have been provided.
    - c. Checked temperature and system controls for proper operation.
    - d. Checked fan rotation for proper operation.
- B. Water Systems - prior to system testing and balancing
  - 1. A complete air balance must be accomplished before beginning the water system test and balance.
  - 2. Open all valves to full open position. Close coil bypass stop valves. Set mixing valves to full coil flow.
  - 3. Set all temperature controls so all coils are calling for full cooling or full heating as required.
  - 4. Verify that the Mechanical Contractor has:
    - a. Removed and cleaned all strainers.
    - b. Treated and cleaned water in system.

3.2 SYSTEM BALANCE

- A. Air Systems - Perform the following minimum tests and balance:
  - 1. Test and adjust supply, return and exhaust fans to design requirements.
  - 2. Test and record motor electrical characteristics, RPM, service factor, measured voltage, full load amperes and connected load amperage. Check and record starter heaters, sizes and ratings, replacing belts sizes, etc.
  - 3. Make pitot tube traverse (minimum of 16 points) of main supply ducts and obtain design CFM at fans. Seal all test holes with suitable hole plugs.

SECTION 23 05 93  
TESTING AND BALANCING

4. Test and record system static pressure, suction and discharge.
  5. Test and adjust system for design CFM recirculated air.
  6. Test and adjust system for design CFM outside air.
  7. Adjust all main supply and return air ducts to proper design CFM.
  8. Adjust all zones to proper design CFM, supply and return.
  9. Test and adjust each diffuser, grille and register to within  $\pm 10\%$  of design requirements.
  10. Each grille, diffuser and register shall be identified as to location and area. Size, type, flow factor and manufacturer of diffusers, grilles, registers and all tested equipment shall be identified and listed.
  11. Readings and tests of diffusers, grilles and registers shall include required FPM velocity and test resultant velocity, required CFM and test resultant CFM after adjustments.
  12. The Balance Contractor shall list all controls requiring adjustment by Temperature Control Contractor and assist Control Contractor with required settings.
  13. All diffusers, grilles and registers shall be adjusted to minimize drafts in all areas.
  14. Read and adjust the minimum and maximum settings on all variable air volume (VAV) boxes. On dual minimum applications, set and confirm both minimums.
- B. Water Systems - Perform the following minimum water system test and balance:
1. Adjust water flow through equipment.
  2. Proceed to balance each water coil.
  3. Upon completion of flow readings and adjustments at coils, mark all settings and record data.
  4. After adjustments to coils are made, recheck settings at the pumps and readjust if required.
  5. Install pressure gauges in gauge fittings provided on coil, read pressure drop through coil at set flow rate for full cooling and on full heating. Set pressure drop across bypass valve to match coil full flow pressure drop.
  6. Install zone balance valve and size the control valve to the coil it serves.
- C. Record Data
1. Air Systems - record the following minimum data:
    - a. CFM delivery and RPM of blowers and fans
      - 1) Static pressure at inlet and outlet of blowers and fans
      - 2) All equipment nameplate data
      - 3) Actual running current and voltage of fan motors and settings for solid state overload relays or heater sizes.
    - b. CFM delivered or exhausted at each diffuser, register, or grille.
  2. Water Systems - record the following minimum data at each heating and cooling element:
    - a. Pressure drop across each coil
    - b. Pressure drop across bypass valve
    - c. Pump operating suction and discharge pressures and final TDH
    - d. Pump nameplate data



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- e. List all mechanical specifications of pumps. Check and record starter size, heater sizes, etc.
  - f. Rated and actual running amperage of pump motor.
  - g. Water balance device readings and/or settings.
- D. Owner's Instructions: Balancing Contractor shall arrange with the Owner at a time for the instruction of the Owner's personnel as to the proper operation and maintenance of the equipment.
- 3.3 ADDITIONAL TEST
- A. Within 90 days of completing testing, adjusting, and balancing, perform additional testing and balancing to verify that balanced conditions are being maintained throughout and to correct unusual conditions.
- B. Seasonal Periods
- 1. If initial testing, adjusting, and balancing procedures were not performed during near-peak summer and winter conditions, perform additional inspections, testing, and adjusting during near-peak summer and winter conditions, if so requested by Owner/Engineer.

END OF SECTION 23 05 93

SECTION 23 05 93  
TESTING AND BALANCING

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SECTION 23 21 13  
HYDRONIC PIPING SYSTEMS

PART 1 – GENERAL

1.1 SUMMARY

- A. This Section includes hydronic piping specialties for the following systems:
  - 1. Dual Temperature Water Systems.
- B. Hydronic systems specialties – this section includes the following:
  - 1. Air Vents.
  - 2. Strainer – Y-Type.
  - 3. Valve – Automatic Flow Control.
- C. Piping: See Section 20 00 60 “Pipe, Valves, Fittings and Hangers for Fire Suppression, Plumbing and HVAC” for Hydronic Piping, Fittings and Valves.

1.2 SUBMITTALS

- A. Product Data: For each type of the following:
  - 1. Valves. Include flow and pressure drop curves based on manufacturer's testing for calibrated-orifice balancing valves and automatic flow-control valves. Submit complete valve schedule with indicated specific equipment designation of coil, connection sizes, flows, components, and pressure drops on a single schedule.
  - 2. Air control devices.
  - 3. Hydronic specialties. Include flow and pressure drop curves based on manufacturer's testing.
- B. Field quality-control test reports.
- C. Operation and maintenance data.

1.3 QUALITY ASSURANCE

- A. ASME Compliance: Comply with ASME B31.9, "Building Services Piping," for materials, products, and installation. Safety valves and pressure vessels shall bear the appropriate ASME label. Fabricate and stamp air separators and expansion tanks to comply with ASME Boiler and Pressure Vessel Code: Section VIII, Division 1.

PART 2 - PRODUCTS

2.1 AIR VENTS

- A. Furnish and install vents where shown and at each high trapped point in closed water systems, each coil, unit heater, piece of radiation and where otherwise required to properly expel air from systems. Pipe air vent outlet to floor drain, drip pan, open-site drain, etc.
- B. Main and Riser Vents: vents for venting mains, branches and risers to have heavy duty cast iron body, seamless copper float and stainless steel or bronze trim.
- C. Branch and Equipment Vents: (Coils, Unit Heaters, Cooling Units, etc.)
  - 1. Vents to have drawn brass body with nickel trim and tapped at top for 1/4" drain connection.
- D. Radiation Vents: vents used for venting radiation to be fiber disc type.
- E. Manual Vents: pipe air chamber with 1/4" brass pet cock.
- F. Manufacturers:
  - 1. Armstrong
  - 2. Bell & Gossett

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HYDRONIC PIPING SYSTEMS

3. Spirax/Sarco
4. Taco
5. Nexus

2.2 STRAINER – Y-TYPE

- A. Furnish and install where indicated on Drawings. Strainers to be full line size.
- B. Strainer body working pressure to be suitable for working pressure of system, but not less than pressure listed below. Screen size to be size listed below.

Strainer Size	Screen Size	Pressure Rating
2" and Smaller	10 MESH (1/16")	250 PSIG
2 ¼ to 4"	10 MESH (1/16")	125 PSIG
5" and Larger	7 MESH (1/8")	125 PSIG

- C. Strainer connections to be threaded for screwed piping, flanged for welded piping. All sizes 2 ½" and above to be Flanged connection.
- D. Strainers to have full tapping size valved blowdown with brass cap. Blowdown tappings above 1" may be 1" size. Valve to be quick opening full port ball valve.
- E. Manufacturers:
  1. Hoffman
  2. Armstrong
  3. Crane
  4. Mueller
  5. Sarco
  6. Victaulic
  7. Nibco

2.3 VALVE – AUTOMATIC FLOW CONTROL

- A. Automatic Flow Limiter
  1. Factory calibrated pressure compensating type valve. Valve shall maintain flow rates within +/-5% regardless of system pressure fluctuations.
  2. Cartridges easily removable from valve body with disturbing existing piping.
  3. Pressure independent design.
  4. Cartridges to be made of stainless steel construction.
  5. Flow rate shall be preset and not field adjustable without replacement of cartridge.
  6. No brass or plastic components permitted.
- B. Valves
  1. Valves shall be equipped with nipples and quick disconnect valves for connection of flow measuring instrumentation. Caps shall be of brass construction. Plastic caps are not acceptable.
  2. Full port ball valve with blow-out proof stem. Internal diameter of the ball shall be equivalent to the pipe size. Reduced port ball valves are not acceptable.

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HYDRONIC PIPING SYSTEMS

- C. Wye-Strainers
  - 1. Strainers shall have 20 mesh rating. Minimum 8:1 ratio of total area vs internal pipe diameter.
  - 2. Stainless Steel Construction
  - 3. Strainer body shall incorporate a full-port isolation ball valve. Reduced port valves are not acceptable.
- D. Submit complete valve schedule with indicated specific equipment designation of coil, connection sizes, flows, components, and pressure drops on a single schedule.
- E. Manufacturers:
  - 1. Flow Design
  - 2. Victaulic
  - 3. Nibco
  - 4. Nexus
  - 5. Pro Hydronic
  - 6. Griswold
  - 7. Bell Gossett
  - 8. Hays

PART 3 - EXECUTION

3.1 VALVE APPLICATIONS

- A. Install shutoff-duty valves at each branch connection to supply mains, and at supply connection to each piece of equipment.
- B. Install check valves at each pump discharge and elsewhere as required to control flow direction.
- C. Install safety valves at hot-water generators and elsewhere as required by ASME Boiler and Pressure Vessel Code. Install drip-pan elbow on safety-valve outlet and pipe without valves to the outdoors; and pipe drain to nearest floor drain or as indicated on Drawings. Comply with ASME Boiler and Pressure Vessel Code: Section VIII, Division 1, for installation requirements.
- D. Install pressure-reducing valves at makeup-water connection to regulate system fill pressure.
- E. Install balance valves at each piece of equipment as noted on drawings.

3.2 PIPING INSTALLATIONS

- A. Install piping of type as indicated in Section 20 00 60.
- B. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Indicate piping locations and arrangements if such were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated unless deviations to layout are approved on Coordination Drawings.
- C. Install piping in concealed locations, unless otherwise indicated and except in equipment rooms and service areas.
- D. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
- E. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.
- F. Install piping to permit valve servicing.

SECTION 23 21 13  
HYDRONIC PIPING SYSTEMS

- G. Install piping at indicated slopes.
  - H. Install piping free of sags and bends.
  - I. Install fittings for changes in direction and branch connections.
  - J. Install piping to allow application of insulation.
  - K. Select system components with pressure rating equal to or greater than system operating pressure.
  - L. Install groups of pipes parallel to each other, spaced to permit applying insulation and servicing of valves.
  - M. Install drains, consisting of a tee fitting, NPS 3/4 (DN 20) ball valve, and short NPS 3/4 (DN 20) threaded nipple with cap, at low points in piping system mains and elsewhere as required for system drainage.
  - N. Install piping at a uniform grade of 0.2 percent upward in direction of flow.
  - O. Install branch connections to mains using tee fittings in main pipe, with the branch connected to the top of the main pipe. For up-feed risers, connect the branch to the top of the main pipe.
  - P. Install valves according to Section 20 00 60.
  - Q. Install unions in piping, NPS 2 (DN 50) and smaller, adjacent to valves, at final connections of equipment, and elsewhere as indicated.
  - R. Install flanges in piping, NPS 2-1/2 (DN 65) and larger, at final connections of equipment and elsewhere as indicated.
  - S. Install strainers on inlet side of each piece of all hydronic equipment(i.e. coils, control valves, chillers, boilers, etc.), pressure-reducing valve, solenoid valves, pumps, and elsewhere, as indicated or required by manufacturer of equipment. Install NPS 3/4 (DN 20) nipple and ball valve in blowdown connection of strainers NPS 2 (DN 50) and larger. Match size of strainer blowoff connection for strainers smaller than NPS 2 (DN 50).
  - T. Install expansion loops, expansion joints, anchors, and pipe alignment guides as shown on drawings.
  - U. Identify piping as specified in Section 20 00 50.
  - V. Install air vents at all high points in system and where piping connects to equipment.
- 3.3 HANGERS AND SUPPORTS
- A. See Section 20 00 60 for hanger installation.
  - B. See Section 20 00 10 for hanging attachment to building construction.
- 3.4 HYDRONIC SPECIALTIES INSTALLATION
- A. Install manual air vents at high points in piping, at heat-transfer coils, and elsewhere as required for system air venting.
- 3.5 TERMINAL EQUIPMENT CONNECTIONS
- A. Sizes for supply and return piping connections shall be the same as or larger than equipment connections.
  - B. Install control valves in accessible locations close to connected equipment. All control valves, strainers, shutoff and balance valves shall be within arm's reach from ladder that is set up to service terminal unit controller. Installing valves beyond arm's reach is not acceptable unless approved by Engineer.

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- C. Install ports for pressure gages and thermometers at coil inlet and outlet connections as detailed on drawings.
  - D. Install all chilled water: control valves, shut off valves, strainers and unions, over drip pan that drains into condensate pan, no exceptions.
  - E. Install supply to the manufacturers listed connection designed for supply. Do not always assume supply connects to the bottom of the equipment connection.
- 3.6 FIELD QUALITY CONTROL
- A. Prepare hydronic piping according to ASME B31.9 and as follows:
    - 1. Leave joints, including welds, un-insulated and exposed for examination during test.
    - 2. Provide temporary restraints for expansion joints that cannot sustain reactions due to test pressure. If temporary restraints are impractical, isolate expansion joints from testing.
    - 3. Flush hydronic piping systems with clean water; then remove and clean or replace strainer screens.
    - 4. Isolate equipment from piping. If a valve is used to isolate equipment, its closure shall be capable of sealing against test pressure without damage to valve. Install blinds in flanged joints to isolate equipment.
    - 5. Install safety valve, set at a pressure no more than one-third higher than test pressure, to protect against damage by expanding liquid or other source of overpressure during test.
  - B. Perform the following tests on hydronic piping:
    - 1. Use ambient temperature water as a testing medium unless there is risk of damage due to freezing. Another liquid that is safe for workers and compatible with piping may be used.
    - 2. While filling system, use vents installed at high points of system to release air. Use drains installed at low points for complete draining of test liquid.
    - 3. Isolate expansion tanks and determine that hydronic system is full of water.
    - 4. Subject piping system to hydrostatic test pressure that is not less than 1.5 times the system's working pressure. Test pressure shall not exceed maximum pressure for any vessel, pump, valve, or other component in system under test. Verify that stress due to pressure at bottom of vertical runs does not exceed 90 percent of specified minimum yield strength or 1.7 times "SE" value in Appendix A in ASME B31.9, "Building Services Piping."
    - 5. After hydrostatic test pressure has been applied for at least 10 minutes, examine piping, joints, and connections for leakage. Eliminate leaks by tightening, repairing, or replacing components, and repeat hydrostatic test until there are no leaks.
    - 6. Prepare written report of testing.
  - C. Perform the following before operating the system:
    - 1. Open manual valves fully.
    - 2. Inspect pumps for proper rotation.
    - 3. Set makeup pressure-reducing valves for required system pressure.
    - 4. Inspect air vents at high points of system and determine if all are installed and operating freely (automatic type), or bleed air completely (manual type).
    - 5. Set temperature controls so all coils are calling for full flow.
    - 6. Inspect and set operating temperatures of hydronic equipment, such as boilers, chillers, cooling towers, to specified values.

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HYDRONIC PIPING SYSTEMS

7. Verify lubrication of motors and bearings.

END OF SECTION 23 21 13



SECTION 23 31 13  
METAL DUCTS

PART 1 – GENERAL

1.1 SUMMARY

A. Section Includes:

1. Rectangular ducts and fittings.
2. Duct Liner.
3. Round ducts and fittings.
4. Access doors
5. Sheet metal materials.
6. Sealants and gaskets.
7. Hangers and supports.

B. Related Sections:

1. Division 23 Section "Testing and Balancing" for testing, adjusting, and balancing requirements for metal ducts.
2. Division 23 Section "Air Duct Accessories" for dampers, sound-control devices, duct-mounting access doors and panels, turning vanes, and flexible ducts.

1.2 PERFORMANCE REQUIREMENTS

A. Delegated Duct Design: Duct construction, including sheet metal thicknesses, seam and joint construction, reinforcements, and hangers and supports, shall comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" and performance requirements and design criteria indicated.

1. Static-Pressure Classes:

- a. Supply Ducts (Upstream from Air Terminal Units): 4-inch wg.
- b. Supply Ducts (Downstream from Air Terminal Units): 1-inch wg.
- c. Supply Ducts (Constant Volume Systems): 2-inch wg.
- d. Return Ducts (Negative Pressure): 2-inch wg.
- e. Exhaust Ducts (Negative Pressure): 1.5-inch wg.

2. Leakage Class:

- a. Round Flat Oval Supply-Air Duct: 3 cfm/100 sq. ft. at 1-inch wg.
- b. Rectangular Supply-Air Duct: 6 cfm/100 sq. ft. at 1-inch wg.
- c. Flexible Supply-Air Duct: 6 cfm/100 sq. ft. at 1-inch wg.

B. Structural Performance: Duct hangers and supports shall withstand the effects of gravity loads and stresses within limits and under conditions described in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible"

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings:

1. Fabrication, assembly, and installation, including plans, elevations, sections, components, and attachments to other work.
2. Factory- and shop-fabricated ducts and fittings.

SECTION 23 31 13  
METAL DUCTS

3. Duct layout indicating sizes, configuration, and static-pressure classes.
  4. Elevation of top of ducts.
  5. Dimensions of main duct runs from building grid lines.
  6. Fittings.
  7. Reinforcement and spacing.
  8. Seam and joint construction.
  9. Penetrations through fire-rated and other partitions.
  10. Equipment installation based on equipment being used on Project.
  11. Locations for duct accessories, including dampers, turning vanes, and access doors and panels.
  12. Hangers and supports, including methods for duct and building attachment and vibration isolation.
  13. The construction documents are not fabrication drawings and are not intended to show all offsets as required for proper ductwork installation. Contractor to field verify all existing conditions and prepare fabrication drawings based on existing conditions. All additional offsets shall be included in bid price.
  14. Submit 2 copies of sheet metal fabrication drawings to Testing and Balancing Contractor for his review prior to submitting to engineer.
- C. Delegated-Design Submittal:
1. Sheet metal thicknesses.
  2. Joint and seam construction and sealing.
  3. Reinforcement details and spacing.
  4. Materials, fabrication, assembly, and spacing of hangers and supports.
- D. Coordination Drawings: Plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
1. Duct installation in congested spaces, indicating coordination with general construction, building components, and other building services. Indicate proposed changes to duct layout.
  2. Suspended ceiling components.
  3. Structural members to which duct will be attached.
  4. Size and location of initial access modules for acoustical tile.
  5. Penetrations of smoke barriers and fire-rated construction.
  6. Items penetrating finished ceiling including the following:
    - a. Lighting fixtures.
    - b. Air outlets and inlets.
    - c. Speakers.
    - d. Sprinklers.
    - e. Access panels.

SECTION 23 31 13  
METAL DUCTS

PART 2 - PRODUCTS

2.1 RECTANGULAR DUCTS AND FITTINGS

- A. General Fabrication Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" based on indicated static-pressure class unless otherwise indicated.
- B. Transverse Joints: Select joint types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 1-4, "Transverse (Girth) Joints," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
- C. Longitudinal Seams: Select seam types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 1-5, "Longitudinal Seams - Rectangular Ducts," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
- D. Elbows, Transitions, Offsets, Branch Connections, and Other Duct Construction: Select types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 2, "Fittings and Other Construction," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
- E. Exposed ductwork in finished areas shall have "paint-grip" finish. Ductwork will be field painted.

2.2 DUCT LINER

- A. Where noted on Drawings, this Contractor shall insulate inside of duct with liner.
- B. All exposed leading edges and transverse joints shall be neatly butted without gaps. All edges shall be factory coated. All field cut edges shall be coated with approved coating/sealant. Manville Superseal Permacote or equal.
- C. Nominal insulation thickness to be 1"
- D. Insulation density shall be 1 ½ #/cu. ft.
- E. Insulation shall have an air stream surface with an acrylic coating and a biocidal component, which satisfies the requirements of ASTM C1071 – "Standard Specification for Thermal and Acoustical Insulation (Glass Fiber, Duct Liner Material)." The material must not support the growth of mold and fungi when tested in accordance with ASTM C665. NBFU approved. All components of duct liner insulation must not exceed 25 flame or 50 smoke developed ratings.
- F. Manufacturers:
  - 1. K-Flex USA Duct Liner Gray
  - 2. Johns Manville Linacoustic R-300
  - 3. Approved equal.

2.3 ROUND DUCTS AND FITTINGS

- A. See Floor Plans for dual wall duct requirements.
- B. General Fabrication Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 3, "Round, Oval, and Flexible Duct," based on indicated static-pressure class unless otherwise indicated.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Linx Inc.

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- b. McGill AirFlow LLC.
  - c. SEMCO Incorporated.
  - d. Sheet Metal Connectors, Inc.
  - e. Spiral Manufacturing Co., Inc.
  - f. United Sheet Metal.
  - g. LaPine
  - h. Eastern Sheet Metal
  - i. JTD Spiral Inc.
- C. Transverse Joints: Select joint types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure showing, "Transverse Joints - Round Duct," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
- 1. Transverse Joints in Ducts Larger Than 60 Inches in Diameter: Flanged.
- D. Longitudinal Seams: Select seam types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure showing, "Seams - Round Duct and Fittings," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
- E. Tees and Laterals: Select types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure showing, "90 Degree Tees and Laterals," and Figure 3-5, "Conical Tees," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
- F. Dual-walled ductwork shall have "paint-grip" finish. Ductwork will be field painted.
- 2.4 ACCESS DOORS (AD)
- A. Construction - steel with 1/2" of fiberglass insulation between door and door pan. Sponge rubber gasketing to be on inside of door frame and between duct and door frame. Door metals to be of sufficient gauge for minimizing leakage at various duct pressures. Hinges not to exceed 12" apart and two handle-type latches to be used for sides exceeding 12".
- 1. Manufacturers:
    - a. Ventfrabrics Ventlok Door
    - b. Buensod Stacey Type F
    - c. Approved equal
- 2.5 SHEET METAL MATERIALS
- A. General Material Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for acceptable materials, material thicknesses, and duct construction methods unless otherwise indicated. Sheet metal materials shall be free of pitting, seam marks, roller marks, stains, discolorations, and other imperfections.
- B. Galvanized Sheet Steel: Comply with ASTM A 653/A 653M.
- 1. Galvanized Coating Designation: G60.
  - 2. Finishes for Surfaces Exposed to View: Mill phosphatized.

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- C. Reinforcement Shapes and Plates: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.
    - 1. Where black- and galvanized-steel shapes and plates are used to reinforce aluminum ducts, isolate the different metals with butyl rubber, neoprene, or EPDM gasket materials.
  - D. Tie Rods: Galvanized steel, 1/4-inch minimum diameter for lengths 36 inches or less; 3/8-inch minimum diameter for lengths longer than 36 inches.
- 2.6 SEALANT AND GASKETS
- A. General Sealant and Gasket Requirements: Surface-burning characteristics for sealants and gaskets shall be a maximum flame-spread index of 25 and a maximum smoke-developed index of 50 when tested according to UL 723; certified by an NRTL.
  - B. Two-Part Tape Sealing System:
    - 1. Tape: Woven cotton fiber impregnated with mineral gypsum and modified acrylic/silicone activator to react exothermically with tape to form hard, durable, airtight seal.
    - 2. Tape Width: 4 inches.
    - 3. Sealant: Modified styrene acrylic.
    - 4. Water resistant.
    - 5. Mold and mildew resistant.
    - 6. Maximum Static-Pressure Class: 10-inch wg, positive and negative.
    - 7. Service: Indoor and outdoor.
    - 8. Service Temperature: Minus 40 to plus 200 deg F.
    - 9. Substrate: Compatible with galvanized sheet steel (both PVC coated and bare), stainless steel, or aluminum.
  - C. Water-Based Joint and Seam Sealant:
    - 1. Application Method: Brush on.
    - 2. Solids Content: Minimum 65 percent.
    - 3. Shore A Hardness: Minimum 20.
    - 4. Water resistant.
    - 5. Mold and mildew resistant.
    - 6. VOC: Maximum 75 g/L (less water).
    - 7. Maximum Static-Pressure Class: 10-inch wg, positive and negative.
    - 8. Service: Indoor or outdoor.
    - 9. Substrate: Compatible with galvanized sheet steel (both PVC coated and bare), stainless steel, or aluminum sheets.
  - D. Flanged Joint Sealant: Comply with ASTM C 920.
    - 1. General: Single-component, acid-curing, silicone, elastomeric.
    - 2. Type: S.
    - 3. Grade: NS.
    - 4. Class: 25.
    - 5. Use: O.

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- E. Flange Gaskets: Butyl rubber, neoprene, or EPDM polymer with polyisobutylene plasticizer.
- F. Round Duct Joint O-Ring Seals:
  - 1. Seal shall provide maximum leakage class of 3 cfm/100 sq. ft. at 1-inch wg and shall be rated for 10-inch wg static-pressure class, positive or negative.
  - 2. EPDM O-ring to seal in concave bead in coupling or fitting spigot.
  - 3. Double-lipped, EPDM O-ring seal, mechanically fastened to factory-fabricated couplings and fitting spigots.

2.7 HANGERS AND SUPPORTS

- A. Hanger Rods for Non-corrosive Environments: Cadmium-plated steel rods and nuts. Clean/degrease for painting where applicable.
- B. Strap and Rod Sizes: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure Showing 5-1, "Rectangular Duct Hangers Minimum Size," and Figure showing 5-2, "Minimum Hanger Sizes for Round Duct."
- C. Steel Cable End Connections: Cadmium-plated steel assemblies with brackets, swivel, and bolts designed for duct hanger service; with an automatic-locking and clamping device.
- D. Duct Attachments: Sheet metal screws, blind rivets, or self-tapping metal screws; compatible with duct materials.
- E. Trapeze and Riser Supports:
  - 1. Supports for Galvanized-Steel Ducts: Galvanized-steel shapes and plates.

PART 3 - EXECUTION

3.1 DUCT INSTALLATION

- A. **Drawing plans, schematics, and diagrams indicate general location and arrangement of duct system. Indicated duct locations, configurations, and arrangements were used to size ducts and calculate friction loss for air-handling equipment sizing and for other design considerations. Install duct systems as indicated unless deviations to layout are approved on Shop Drawings and Coordination Drawings.**
- B. Install dual wall insulated duct in exposed areas as noted on Drawings.
- C. Install ducts according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" unless otherwise indicated.
- D. Install round ducts in maximum practical lengths.
- E. Install ducts with fewest possible joints.
- F. Install factory- or shop-fabricated fittings for changes in direction, size, and shape and for branch connections.
- G. Unless otherwise indicated, install ducts vertically and horizontally, and parallel and perpendicular to building lines.
- H. Install ducts close to walls, overhead construction, columns, and other structural and permanent enclosure elements of building.
- I. Install ducts with a clearance that will allow for insulation thickness.
- J. Route ducts so that they do not pass through transformer vaults, electrical equipment rooms, stairwell enclosures and elevator equipment rooms.

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- K. Where ducts pass through non-fire-rated interior partitions and exterior walls, cover the opening between the partition and duct or duct insulation with sheet metal flanges (picture frames) of same metal thickness as the duct. Overlap openings on four sides by at least 1-1/2 inches.
- L. Where ducts pass through fire-rated interior partitions and exterior walls, install fire dampers. Comply with requirements in Division 23 Section "Air Duct Accessories" for fire and smoke dampers.
- M. Protect duct interiors from moisture, construction debris and dust, and other foreign materials. Comply with "Intermediate Level" standards as identified in SMACNA's "Duct Cleanliness for New Construction Guidelines." All ducts and air openings on equipment shall be covered and protected throughout construction until ready for use.

3.2 SEAM AND JOINT SEALING

- A. Seal duct seams and joints for duct static-pressure and leakage classes specified in "Performance Requirements" Article, according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table 1-1, "Standard Duct Sealing Requirements," unless otherwise indicated.
- B. Seal Classes: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table showing 1-1, "Standard Duct Sealing Requirements."

3.3 HANGER AND SUPPORT INSTALLATION

- A. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter for, "Hangers and Supports."
- B. Building Attachments: Concrete inserts, powder-actuated fasteners, or structural-steel fasteners appropriate for construction materials to which hangers are being attached.
  - 1. Install powder-actuated concrete fasteners after concrete is placed and completely cured.
  - 2. Use powder-actuated concrete fasteners for standard-weight aggregate concretes or for slabs more than 4 inches thick.
  - 3. Do not use powder-actuated concrete fasteners for lightweight-aggregate concretes or for slabs less than 4 inches thick.
  - 4. Do not use powder-actuated concrete fasteners for seismic restraints.
- C. Hanger Spacing: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table showing 5-1, "Rectangular Duct Hangers Minimum Size," and Table showing 5-2, "Minimum Hanger Sizes for Round Duct," for maximum hanger spacing; install hangers and supports within 24 inches of each elbow and within 48 inches of each branch intersection.
- D. Hangers Exposed to View: Threaded rod and angle or channel supports. Clean/degrease where painting is to occur.
- E. Support vertical ducts with steel angles or channel secured to the sides of the duct with welds, bolts, sheet metal screws, or blind rivets; support at each floor and at a maximum intervals of 16 feet.
- F. Install upper attachments to structures. Select and size upper attachments with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.
- G. Install stiffener's, turning vanes, and or air straighteners as required to stop objectionable duct oil canning, or fan surge to the satisfaction of the engineer.

3.4 CONNECTIONS

- A. Make connections to equipment with flexible connectors complying with Division 23 Section "Air Duct Accessories."

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- B. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for branch, outlet and inlet, and terminal unit connections.

3.5 DUCT SCHEDULE

- A. Fabricate supply, return, outdoor air, and relief air ducts with galvanized sheet steel unless noted otherwise on drawings or within specifications.

- B. Intermediate Reinforcement:

- 1. Galvanized-Steel Ducts: Galvanized steel.

- C. Elbow Configuration:

- 1. Rectangular Duct: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure showing, "Rectangular Elbows."

- a. Velocity 1000 fpm or Lower:

- 1) Radius Type RE 1 with minimum 0.5 radius-to-diameter ratio.
      - 2) Mitered Type RE 4 without vanes.

- b. Velocity 1000 to 1500 fpm:

- 1) Mitered Type RE 2 with vanes complying with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure showing, "Vanes and Vane Runners," and Figure showing, "Vane Support in Elbows."

- c. Velocity 1500 fpm or Higher:

- 1) Mitered Type RE 2 with vanes complying with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure showing, "Vanes and Vane Runners," and Figure showing, "Vane Support in Elbows."

- 2. Round Duct: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure showing, "Round Duct Elbows."

- a. Minimum Radius-to-Diameter Ratio and Elbow Segments: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table showing, "Mitered Elbows." Elbows with less than 90-degree change of direction have proportionately fewer segments.

- 1) Velocity 1000 fpm or Lower: 0.5 radius-to-diameter ratio and three segments for 90-degree elbow.
      - 2) Velocity 1000 to 1500 fpm: 1.0 radius-to-diameter ratio and four segments for 90-degree elbow.
      - 3) Velocity 1500 fpm or Higher: 1.5 radius-to-diameter ratio and five segments for 90-degree elbow.

- b. Round Elbows, 12 Inches and Smaller in Diameter: Stamped or pleated.

- c. Round Elbows, 14 Inches and Larger in Diameter: Welded.

- D. Branch Configuration:

- 1. Rectangular Duct: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 4-6, "Branch Connections."

- a. Rectangular Main to Rectangular Branch: 45-degree entry. No spin-in type fittings allowed.



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2. Round: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-5, "90 Degree Tees and Laterals," and Figure 3-6, "Conical Tees." Saddle taps are permitted in existing duct.
  - a. Velocity 1000 fpm or Lower: 90-degree tap.
  - b. Velocity 1000 to 1500 fpm: Conical tap.
  - c. Velocity 1500 fpm or Higher: 45-degree lateral.
- E. Escutcheons:
  1. For all duct penetrations thru walls into finished areas duct shall have neat shop fabricated picture frame escutcheon on finished side of wall.
    - a. This applies to both round and square duct work.
    - b. Externally insulated ducts to have escutcheon oversized by thickness of insulation.
    - c. Ducts without insulation to have escutcheon tight to exterior of duct.
    - d. Escutcheon to be fastened to wall and not duct.
    - e. Escutcheon to be of quality finish and paintable.

END OF SECTION 23 31 13

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METAL DUCTS

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SECTION 23 33 00  
AIR DUCT ACCESSORIES

PART 1 – GENERAL

1.1 SUMMARY

- A. Section Includes:
  - 1. Materials.
  - 2. Counter balanced backdraft dampers. (CBBB)
  - 3. Manual volume dampers.
  - 4. Flange connectors.
  - 5. Turning vanes.
  - 6. Duct-mounted access doors.
  - 7. Flexible connectors.
  - 8. Flexible ducts.
  - 9. Duct accessory hardware.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For duct accessories. Include plans, elevations, sections, details and attachments to other work on 1/4" = 1'-0" scale drawings.
  - 1. Detail duct accessories fabrication and installation in ducts and other construction. Include dimensions, weights, loads, and required clearances; and method of field assembly into duct systems and other construction. Include the following:
    - a. Special fittings.
    - b. Manual volume damper installations.
  - 2. The construction documents are not fabrication drawings and are not intended to show all offsets as required for proper ductwork installation. Contractor to field verify all existing conditions and prepare fabrication drawings based on existing conditions. All additional offsets shall be included in bid price.
- C. Operation and maintenance data.

1.3 QUALITY ASSURANCE

- A. Comply with NFPA 90A, "Installation of Air Conditioning and Ventilating Systems," and with NFPA 90B, "Installation of Warm Air Heating and Air Conditioning Systems."
- B. Comply with AMCA 500-D testing for damper rating.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for acceptable materials, material thicknesses, and duct construction methods unless otherwise indicated. Sheet metal materials shall be free of pitting, seam marks, roller marks, stains, discolorations, and other imperfections.
- B. Galvanized Sheet Steel: Comply with ASTM A 653/A 653M.
  - 1. Galvanized Coating Designation: G90.
  - 2. Exposed-Surface Finish: Mill phosphatized.

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- C. Aluminum Sheets: Comply with ASTM B 209, Alloy 3003, Temper H14; with mill finish for concealed ducts and standard, 1-side bright finish for exposed ducts.
- D. Extruded Aluminum: Comply with ASTM B 221, Alloy 6063, Temper T6.
- E. Reinforcement Shapes and Plates: Galvanized-steel reinforcement where installed on galvanized sheet metal ducts; compatible materials for aluminum and stainless-steel ducts.
- F. Tie Rods: Galvanized steel, 1/4-inch minimum diameter for lengths 36 inches or less; 3/8-inch minimum diameter for lengths longer than 36 inches.

2.2 COUNTER BALANCED BACKDRAFT DAMPERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Greenheck EM
  - 2. Ruskin CBD2.
  - 3. United Enertech
  - 4. Pottorff
  - 5. NCA Mfg.
- B. Description: Gravity balanced with adjustable weights. Adjustable open from .01" to .15".
- C. Frame: 0.090-inch- thick 6063T5 extruded aluminum, with welded corners and 12-gauge brace at each corner.
- D. Blades: Multiple single-piece blades, maximum 6-inch width, 0.025-inch- thick, roll-formed aluminum with vinyl blade edge seals.
- E. Blade Action: Parallel.
- F. Blade Axles:
  - 1. Material: Aluminum.
  - 2. Diameter: 0.20 inch.
- G. Tie Bars and Brackets: Aluminum.
- H. Bearings: Synthetic pivot bushings.
- I. Accessories:
  - 1. Adjustment device to permit setting for varying differential static pressure.
  - 2. Counterweights and spring-assist kits for vertical airflow installations.
- J. Sleeve: Minimum 20-gage thickness.

2.3 MANUAL VOLUME DAMPERS

- A. Standard, Steel, Manual Volume Dampers:
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Air Balance Inc.; a division of Mestek, Inc.
    - b. American Warming and Ventilating; a division of Mestek, Inc.
    - c. Flexmaster U.S.A., Inc.
    - d. McGill AirFlow LLC.
    - e. METALAIRE, Inc.

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- f. Nailor Industries Inc.
  - g. Ruskin Company.
  - h. Greenheck.
  - i. Vent Products Company, Inc.
  - j. United Enertech
  - k. Pottorff
  - l. NCA Mfg.
- 2. Suitable for horizontal or vertical applications.
  - 3. Frames:
    - a. Hat-shaped, galvanized-steel channels, 16 ga. minimum thickness.
    - b. Mitered and welded corners.
    - c. Flanges for attaching to walls and flangeless frames for installing in ducts.
  - 4. Blades:
    - a. Multiple (min. 16 ga) or Single blade(min. 20 ga)
    - b. Parallel- or opposed-blade design.
    - c. Stiffen damper blades for stability.
    - d. Galvanized-steel
  - 5. Blade Axles: Galvanized steel.
    - a. Dampers in ducts with pressure classes of 3-inch wg or less shall have axles full length of damper blades and bearings at both ends of operating shaft.
  - 6. Tie Bars and Brackets: Galvanized steel.
- B. Jackshaft:
- 1. Material: Galvanized-steel pipe rotating within pipe-bearing assembly mounted on supports at each mullion and at each end of multiple-damper assemblies.
  - 2. Length and Number of Mountings: As required to connect linkage of each damper in multiple-damper assembly.
- C. Damper Hardware:
- 1. Zinc-plated, die-cast core with dial and handle made of 3/32-inch- thick zinc-plated steel, and a 1/4-inch hexagon locking nut.
  - 2. Include center hole to suit damper operating-rod size.
  - 3. Include standoff bracket for insulated duct mounting.
- 2.4 FLANGE CONNECTORS
- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
- 1. Ductmate Industries, Inc.
  - 2. Nexus PDQ; Division of Shilco Holdings Inc.
  - 3. Ward Industries, Inc.; a division of Hart & Cooley, Inc.

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AIR DUCT ACCESSORIES

- B. Description: roll-formed, factory-fabricated, slide-on transverse flange connectors, gaskets, and components.
- C. Material: Galvanized steel.
- D. Gage and Shape: Match connecting ductwork.

2.5 TURNING VANES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Ductmate Industries, Inc.
  - 2. Duro Dyne Inc.
  - 3. METALAIRE, Inc.
  - 4. SEMCO Incorporated.
  - 5. Ward Industries, Inc.; a division of Hart & Cooley, Inc.
- B. Turning Vanes for Metal Ducts: Curved blades of galvanized sheet steel; support with bars perpendicular to blades set; set into vane runners suitable for duct mounting.
- C. General Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible"; Figures 4-3, "Vanes and Vane Runners," and 4-4, "Vane Support in Elbows."
- D. Vane Construction: Single wall for ducts up to 48 inches wide and double wall for larger dimensions.

2.6 DUCT-MOUNTED ACCESS DOORS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. American Warming and Ventilating; a division of Mestek, Inc.
  - 2. Cesco Products; a division of Mestek, Inc.
  - 3. Ductmate Industries, Inc.
  - 4. Flexmaster U.S.A., Inc.
  - 5. Greenheck Fan Corporation.
  - 6. McGill AirFlow LLC.
  - 7. Nailor Industries Inc.
  - 8. Buensod Stacey Type F.
  - 9. Ventfabrics, Inc.
  - 10. Ward Industries, Inc.; a division of Hart & Cooley, Inc.
  - 11. Pottorff
- B. Duct-Mounted Access Doors: Fabricate access panels according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible"; Figures 7-2, "Duct Access Doors and Panels," and 7-3, "Access Doors - Round Duct."
  - 1. Door:
    - a. Double wall, rectangular.
    - b. Galvanized sheet metal with insulation fill and thickness as indicated for duct pressure class.

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- c. Hinges and Latches: 1-by-1-inch butt or piano hinge and cam latches.
- d. Fabricate doors airtight and suitable for duct pressure class.
- 2. Frame: Galvanized sheet steel, with bend-over tabs and foam gaskets.
- 3. Number of Hinges and Locks:
  - a. Access Doors Less Than 12 Inches Square: No hinges and two sash locks.
  - b. Access Doors up to 18 Inches Square: Two hinges and two sash locks.
  - c. Access Doors up to 24 by 48 Inches: Three hinges and two compression latches with outside and inside handles.
  - d. Access Doors Larger Than 24 by 48 Inches: Four hinges and two compression latches with outside and inside handles.

2.7 FLEXIBLE CONNECTORS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Ductmate Industries, Inc.
  - 2. Duro Dyne Inc.
  - 3. Ventfabrics, Inc.
  - 4. Ward Industries, Inc.; a division of Hart & Cooley, Inc.
- B. Materials: Flame-retardant or noncombustible fabrics.
- C. Coatings and Adhesives: Comply with UL 181, Class 1.
- D. Indoor System, Flexible Connector Fabric: Glass fabric double coated with neoprene.
  - 1. Minimum Weight: 26 oz./sq. yd.
  - 2. Tensile Strength: 480 lbf/inch in the warp and 360 lbf/inch in the filling.
  - 3. Service Temperature: Minus 20 to plus 200 deg F.
- E. Outdoor System, Flexible Connector Fabric: Glass fabric double coated with weatherproof, synthetic rubber resistant to UV rays and ozone.
  - 1. Minimum Weight: 24 oz./sq. yd.
  - 2. Tensile Strength: 530 lbf/inch in the warp and 440 lbf/inch in the filling.
  - 3. Service Temperature: Minus 20 to plus 250 deg F.
- F. Thrust Limits: Combination coil spring and elastomeric insert with spring and insert in compression, and with a load stop. Include rod and angle-iron brackets for attaching to fan discharge and duct.
  - 1. Frame: Steel, fabricated for connection to threaded rods and to allow for a maximum of 30 degrees of angular rod misalignment without binding or reducing isolation efficiency.
  - 2. Outdoor Spring Diameter: Not less than 80 percent of the compressed height of the spring at rated load.
  - 3. Minimum Additional Travel: 50 percent of the required deflection at rated load.
  - 4. Lateral Stiffness: More than 80 percent of rated vertical stiffness.
  - 5. Overload Capacity: Support 200 percent of rated load, fully compressed, without deformation or failure.

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AIR DUCT ACCESSORIES

6. Elastomeric Element: Molded, oil-resistant rubber or neoprene.
7. Coil Spring: Factory set and field adjustable for a maximum of 1/4-inch movement at start and stop.

2.8 FLEXIBLE DUCTS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  1. Wiremold Type 86-C.
  2. Aircon-Duct.
  3. Flexmaster U.S.A., Inc.
  4. McGill AirFlow LLC.
  5. Ward Industries, Inc.; a division of Hart & Cooley, Inc.
- B. Insulated, Flexible Duct: UL 181, Class 1, black polymer film supported by helically wound, spring-steel wire; fibrous-glass insulation; polyethylene vapor-barrier film.
  1. Pressure Rating: 4-inch wg positive and 1-inch wg negative.
  2. Maximum Air Velocity: 4000 fpm.
  3. Temperature Range: Minus 20 to plus 175 deg F.
- C. Flexible Duct Connectors:
  1. Clamps and Sheetmetal Screws: Nylon strap in sizes 3 through 18 inches with 3 sheetmetal screws to prevent blow-off of duct, to suit duct size.
  2. Non-Clamp Connectors: Adhesive plus sheet metal screws.

2.9 DUCT ACCESSORY HARDWARE

- A. Instrument Test Holes: Cast iron or cast aluminum to suit duct material, including screw cap and gasket. Size to allow insertion of pitot tube and other testing instruments and of length to suit duct-insulation thickness.
- B. Adhesives: High strength, quick setting, neoprene based, waterproof, and resistant to gasoline and grease.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install duct accessories according to applicable details in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for metal ducts and in NAIMA AH116, "Fibrous Glass Duct Construction Standards," for fibrous-glass ducts.
- B. Install duct accessories of materials suited to duct materials; use galvanized-steel accessories in galvanized-steel ducts and aluminum accessories in aluminum ducts.
- C. Install backdraft and/or control isolation dampers at outlet of exhaust fans or exhaust ducts as close as possible to exhaust fan unless otherwise indicated.
- D. Install volume dampers at points on supply, return, and exhaust systems where branches extend from larger ducts. Install volume dampers at all locations as required for balancing whether shown or not. Dampers specified on backs of grilles shall not be used for balancing unless approved by Engineer.
  1. Install steel volume dampers in steel ducts.
  2. Install aluminum volume dampers in aluminum ducts.



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- E. Set dampers to fully open position before testing, adjusting, and balancing.
  - F. Install test holes at fan inlets and outlets and elsewhere as indicated.
  - G. Install fire, smoke, combination fire and smoke and ceiling radiation dampers according to UL listing.
  - H. Install duct access doors on sides of ducts to allow for inspecting, adjusting, and maintaining accessories and equipment at the following locations:
    - 1. On both sides of duct coils.
    - 2. Adjacent to and close enough to fire or smoke dampers, to reset or reinstall fusible links. Access doors for access to fire or smoke dampers having fusible links shall be pressure relief access doors; and shall be outward operation for access doors installed upstream from dampers and inward operation for access doors installed downstream from dampers.
    - 3. At changes of direction of kitchen hood exhaust ducts.
    - 4. Elsewhere as indicated.
  - I. Install access doors with swing against duct static pressure.
  - J. Access Door Sizes:
    - 1. One-Hand or Inspection Access: 8 by 5 inches.
    - 2. Two-Hand Access: 12 by 6 inches.
    - 3. Head and Hand Access: 18 by 10 inches.
    - 4. Head and Shoulders Access: 21 by 14 inches.
    - 5. Body Access: 25 by 14 inches.
    - 6. Body plus Ladder Access: 25 by 17 inches.
  - K. Label access doors according to Section 20 00 50.
  - L. Install flexible canvas connectors to connect ducts to equipment.
  - M. For fans developing static pressures of 5-inch wg and more, cover flexible connectors with loaded vinyl sheet held in place with metal straps.
  - N. Connect terminal units to supply ducts with maximum 12-inch lengths of flexible duct rated at 10" static, strapped in place with 3 sheet metal screw stop keep straps from blowing off ducts. Do not use flexible ducts to change directions.
  - O. Connect diffusers or light troffer boots to low-pressure ducts with maximum 36-inch lengths of flexible duct (rated at 4" static) strapped in place.
  - P. Connect flexible ducts to metal ducts with draw bands plus sheet metal screws.
  - Q. Install duct test holes where required for testing and balancing purposes.
  - R. All dampers that penetrate building envelope shall be insulated dampers. This includes all exhaust, return and relief dampers.
- 3.2 FIELD QUALITY CONTROL
- A. Tests and Inspections:
    - 1. Operate dampers to verify full range of movement.
    - 2. Inspect locations of access doors and verify that purpose of access door can be performed.
    - 3. Operate fire, smoke and combination fire and smoke dampers to verify full range of movement and verify that proper heat-response device is installed.

SECTION 23 33 00  
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4. Inspect turning vanes for proper and secure installation.
5. Operate remote damper operators to verify full range of movement of operator and damper.

END OF SECTION 23 33 00

SECTION 23 37 13  
DIFFUSERS, REGISTERS, GRILLES AND LOUVERS

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes ceiling-, floor- and wall-mounted diffusers, registers, and grilles.

This Section includes but is not limited to:

1. Ceiling Diffusers
2. Grilles and Registers
3. Eggcrate Return Grilles
4. Return Air Canopies

- B. Related Sections include the following:

1. Division 23 Section "Air Duct Accessories" for fire and smoke dampers and volume-control dampers not integral to diffusers, registers, and grilles.

1.3 SUBMITTALS

- A. Product Data: For each product indicated, include the following:

1. Data Sheet: Indicate materials of construction, finish, and mounting details; and performance data including throw and drop, static-pressure drop, and noise ratings.
2. Diffuser, Register, and Grille Schedule: Indicate Drawing designation, room location, quantity, model number, size, and accessories furnished.

PART 2 - PRODUCTS

2.1 CEILING DIFFUSERS

- A. Square Ceiling Diffusers:

1. Manufacturers:
  - a. Price Industries
  - b. Titus
  - c. Nailor Industries
  - d. MetalAire
2. Material: Steel.
3. Finish: Baked enamel, white.
4. Face Size: As scheduled on the Drawings.
5. Face Style: Three cone
6. Mounting: Surface, T-bar, Snap in or Panel mounted. Reference Architectural drawings for ceiling type.
7. Pattern: Adjustable.
8. Accessories:
  - a. Plaster ring (when applicable).

SECTION 23 37 13  
DIFFUSERS, REGISTERS, GRILLES AND LOUVERS

- b. All back surfaces factory insulated with foil-backed insulation or molded insulation blanket.
- 9. Verification of Performance: Rate diffusers, registers, and grilles according to ASHRAE 70, "Method of Testing for Rating the Performance of Air Outlets and Inlets."

2.2 GRILLES AND REGISTERS

- A. Manufacturers:
  - 1. Price Industries
  - 2. Titus
  - 3. Nailor Industries
  - 4. MetalAire
- B. Capacity, size, and noise criteria as Scheduled (Return and Exhaust). Additional sizes may be required as indicated and noted on individual Drawings.
- C. Material: Heavy gauge steel or heavy gauge aluminum. Provide aluminum construction for installations in shower rooms and corrosive environments.
- D. Finish: Baked enamel, white (unless noted otherwise on Drawings).
- E. Mounting: Countersunk screws
- F. Frame: 1-1/4" wide.
- G. Metal plaster frames: for grilles mounted on plaster, masonry, fiber or metal construction surfaces.
- H. Panel mounted where installed in T-bar ceilings unless noted otherwise.
- I. Volume Damper: Opposed blade operable through face of grille.
- J. Deflecting Blades: 3/4" spacing
- K. Supply Grilles: Similar to Titus 272 Series - airfoil blades, double deflection. Horizontal blades always mounted nearest grille face.
- L. Return Grilles: Similar to Titus 350 Series - single deflection blades fixed at 35°/45° down (unless noted otherwise on Drawings).
- M. Exhaust Grilles: Similar to Titus 350 Series - single deflection blades fixed at 35°/45° down.

2.3 EGG CRATE RETURN GRILLES

- A. Manufacturers:
  - 1. Price Industries
  - 2. Titus 50F
  - 3. Nailor Industries
  - 4. MetalAire
- B. Material: Aluminum
- C. Core Construction: 1/2" x 1/2" x 1/2" aluminum grid core.
- D. Finish: Baked enamel, white (unless noted otherwise on Drawings).
- E. Mounting: 1" inverted T-bar border for mounting in lay-in ceiling, 1-1/4 aluminum border with countersunk screw holes for surface mounting.

SECTION 23 37 13  
DIFFUSERS, REGISTERS, GRILLES AND LOUVERS

F. Installation:

1. Install internally lined acoustical boot on back of grilles unless noted otherwise.
2. Reference Drawings for additional information.

2.4 RETURN AIR CANOPIES

A. General:

1. Return Air Canopy air transfer silencers of the size, configuration, and acoustic performance as described on the plans and schedules.

B. Performance:

1. Return air canopy performance characteristics, including insertion loss and pressure drop, shall be attained through testing in accordance with ASTM Standard E477.
2. Laboratory performance verification in the manufacturer's test facility may be requested, in which case a comparative test report shall be made available to the engineer.

C. Construction:

1. Return air canopies shall be constructed in accordance with ASHRAE and SMACNA Standards for the pressure and velocity classification specified for the air distribution system in which it is installed.
2. Return air canopies shall be constructed of:
  - a. 24-gauge solid steel casing
  - b. Acoustic media:
    - 1) Absorptive acoustic fiberglass media.
    - 2) Acoustic media:
      - a) Fiberglass media:
      - b) Acoustic media shall be shot-free inorganic glass fiber with long, resilient fibers, bonded with thermosetting resin.
      - c) Glass fiber shall be in accordance with erosion requirements of UL 181, and shall conform to the physical properties and requirements of ASTM C1071.
3. Fire-Performance Characteristics:
  - a. Air transfer silencer assemblies, including acoustic media fill, sealants, and acoustical spacers shall have combustion rating equal to or less than shown below when tested according to ASTM E84, NFPA 255 or UL 723:
    - 1) Flame-spread index not exceeding 25
    - 2) Smoke-developed index not exceeding 50

D. Manufacturers

1. Price RAC
2. Approved equal

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas where diffusers, registers, and grilles are to be installed for compliance with requirements for installation tolerances and other conditions affecting performance of equipment.

SECTION 23 37 13  
DIFFUSERS, REGISTERS, GRILLES AND LOUVERS

- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install diffusers, registers, and grilles level and plumb.
- B. Ceiling-Mounted Outlets and Inlets: Drawings indicate general arrangement of ducts, fittings, and accessories. Air outlet and inlet locations have been indicated to achieve design requirements for air volume, noise criteria, airflow pattern, throw, and pressure drop. Make final locations where indicated, as much as practicable. For units installed in lay-in ceiling panels, locate units in the center of panel if not of panel dimension. Where architectural features or other items conflict with installation, notify Architect for a determination of final location.
- C. Install diffusers, registers, and grilles with airtight connections to ducts and to allow service and maintenance of dampers, air extractors, and fire dampers.

3.3 ADJUSTING

- A. After installation, adjust diffusers, registers, and grilles to air patterns indicated, or as directed, before starting air balancing.

END OF SECTION 23 37 13

SECTION 23 82 19  
FAN COIL UNITS

PART 1 – GENERAL

1.1 SUMMARY

- A. This Section includes fan-coil units and accessories.
  - 1. Fan Coils – Horizontal

1.2 SUBMITTALS

- A. Product Data: Include rated capacities, operating characteristics, furnished specialties, and accessories.
- B. Shop Drawings: Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
  - 1. Wiring Diagrams: Power, signal, and control wiring. Wiring diagrams must match the equipment provided. Custom factory wiring such as terminal strip designations must be provided. Costs associated with field changes required if accurate wiring diagrams are not provided shall be borne by the equipment manufacturer.
- C. Field quality-control test reports.
- D. Operation and maintenance data.

1.3 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

PART 2 - PRODUCTS

2.1 FAN COIL (FC) - Horizontal

- A. Description: Factory-packaged and -tested units rated according to ARI 440, ASHRAE 33, and UL 1995.
- B. Capacity, voltage, mounting arrangement shown on Drawings.
- C. Ratings
  - 1. Air quantity, cooling capacity, heating capacity, coil pressure drop and electric power consumption ratings to be certified in accordance with ARI procedures and standards.
  - 2. Minimum capacities shall be maintained with maximum GPM noted on Drawings.
  - 3. All units listed by UL.
  - 4. Units to be quiet in operation.
- D. Water Coils
  - 1. Non-ferrous fins and tubes: tested at 250 psig. Mount coil to drain condensate without interrupting air flow. Firm fin to tube contact.
  - 2. Coils to be easily removable by unscrewing pipe unions between coil and valves and pulling coil out front of unit. Holes in side sheets large enough to remove unions and air vent.
  - 3. Provide air vent at top of coil.
  - 4. Heating water coil first, chilled water coil second. - Closest to discharge.
- E. Valves and Piping
  - 1. By Others.

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FAN COIL UNITS

2. See details on Drawings.
- F. Drain Pan
1. Large enough to catch all condensate from coil, return bends and valves at coil header.
  2. Constructed with smooth inside surface of stainless steel or preformed plastic, externally insulated (not to sweat), pitched for complete drainage. Drain connection shall be at side of pan. Invert of drainpipe shall be below bottom of pan. All four corners of metal drain pan shall be welded for watertight seal. No folding of pan to form corners allowed. No standing condensate allowed in pan.
  3. Air vent to be located above drain pan and faced to be operated manually from side of unit.
  4. Provide drain pan extension of size that will completely cover area below strainers, valves and fittings to catch all condensate from trim.
- G. Fans
1. Double inlet squirrel cage, statically and dynamically balanced. Fan wheel and scroll to be corrosion resistant.
  2. Fan mounting deck, fans and motor removable for servicing with plug-in electrical connection. Fan deck to be removable without use of special tools. Fastening devices shall be accessible by hand.
- H. Motor Controllers
1. Variable speed.
- I. Electrical
1. Factory installed and wired fused disconnect switch, mounted to or inside cabinet housing.
- J. Filters
1. Concealed units shall be supplied without filters, if return air is filtered upstream of the unit by filter return grilles provided by the Sheet Metal Contractor. See floor plans for location.
  2. Concealed units that have filters shall be furnished with 2" thick pleated filters with a MERV-8 rating.
  3. Provide three sets of filters.
- K. Unit Enclosure
1. Units' arrangement and style shall be as scheduled on the drawings.
  2. Enclosure shall have flange for supply and return duct connections.
  3. Enclosure shall not have openings between filter and coils.
  4. Insulation: fan and cold air plenum, and enclosure to be internally insulated with flexible elastomeric insulation to eliminate sweating and reduce airborne noise generated by fans.
  5. Cabinet enclosure constructed of 16-gauge steel.
- L. Manufacturers:
1. International
  2. Williams
  3. The Whalen Company
  4. Zehnder-Rittling



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FAN COIL UNITS

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install fan-coil units to comply with NFPA 90A.
- B. Suspended fan-coil units from structure to have elastomeric hangers.
- C. Install new filters in each fan-coil unit within two weeks after Substantial Completion.
- D. Drawings indicate general arrangement of piping, fittings, and specialties. Specific connection requirements are as follows:
  - 1. Install piping adjacent to machine to allow service and maintenance.
  - 2. Connect condensate drain to indirect waste.
    - a. Install condensate trap of adequate depth to seal against the pressure of fan. Install cleanouts in piping at changes of direction.
- E. Connect supply and return ducts to fan-coil units with flexible duct connectors specified in Division 23 Section "Air Duct Accessories". Comply with safety requirements in UL 1995 for duct connections.

3.2 FIELD QUALITY CONTROL

- A. Perform the following field tests and inspections and prepare test reports:
  - 1. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.
  - 2. Test and adjust controls and safety devices. Replace damaged and malfunctioning controls and equipment.
- B. Remove and replace malfunctioning units and retest as specified above.

END OF SECTION 23 82 19

SECTION 23 82 19  
FAN COIL UNITS

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COMMON WORK RESULTS FOR ELECTRICAL

## PART 1 – GENERAL

## 1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General, Supplementary, and Special Conditions apply to all electrical work.

## 1.02 DESCRIPTION OF WORK

- A. Section 26 05 00 applies to all electrical materials, equipment, installations and services supplied under any portion of the work.
- B. All work must meet or exceed all Local, State and Federal Codes and ADA Guidelines.
- C. All Electrical Contractor or Electrical Sub-contractor work shall be performed by a licensed and bonded Electrical Contractor with at least five (5) years of successful installation experience on projects with electrical work similar to this project.
- D. The Electrical Contractor or Electrical Sub-contractor shall coordinate the Basic Requirements as applicable to any equipment, installations and services of an electrical nature.
- E. It is the intention of this Division of the Specifications and the accompanying drawings to describe and provide for the furnishing, installing, testing and placing in satisfactory and successful operation all equipment, materials, devices and necessary appurtenances to provide a complete electrical system.
- F. The Contract drawings indicate the extent and the general location and arrangement of equipment, conduit and wiring. The General Contractor and their Electrical Sub-contractor shall study the plans and details and shall coordinate with all other trades to prevent conflict and interference with other installations.
- G. The Electrical Contractor or the Electrical Sub-contractor is responsible for installation of a complete and operating electrical system in accordance with the intent of the Drawings and Specifications.
- H. Any minor changes in location of equipment and conduits from those shown on the plans shall be made without extra charge if so directed by the Owner prior to installation.
- I. All equipment shall be installed such that maintenance and service may be properly accomplished. If necessary, the Owner may at their option require the contractor to demonstrate the service on any piece of equipment to determine sufficient service space exists. If service space is not adequate, the equipment shall be relocated at no additional cost to the Owner so that sufficient service space is achieved.

## 1.03 PERMITS AND FEES

- A. This work shall include the procurement of and payment for all permits and fees for the performance of the electrical work.

## 1.04 SUBMITTALS

- A. The following items that shall be submitted for approval prior to ordering. Submit individually by the appropriate Specification Section number.

COMMON WORK RESULTS FOR ELECTRICAL

1. Raceway (unless special raceway is specified a letter on Company letterhead stating the products to be used are in conformance with the Specifications is acceptable as a Submittal. Check with Engineer/Owner)
2. Wire (unless special wire is specified a letter on Company letterhead stating the products to be used are in conformance with the Specifications is acceptable as a Submittal. Check with Engineer/Owner)
3. Wiring Devices and Covers
4. Lighting Fixtures
5. Disconnect Switches
6. Motor Starters
7. Panelboards and Switchboards
8. Fire Alarm
9. Others as required by the related Division 26 Section.

B. Submission of the above information shall be electronically in ISU approved PDF Format.

## 1.05 PROJECT CLOSEOUT

- A. On Electrical Prime Projects one set of all Project documents shall be submitted electronically in PDF Format on a USB Flash Drive. The following is a list, but not limited to, of required documentation to be included on the USB flash drive:
  1. Bid Form
  2. Award Letter and Contract for Construction
  3. Meeting minutes and supporting documentation.
  4. Reviewed submittals and reviewed shop drawings
  5. All Change documentation, e.g. ASI, RFI, CCD, RFP, CP, CO, etc.
  6. Pay Applications
  7. Installation instructions and schematic drawings
    - a. Complete parts list with manufacturer's model numbers.
    - b. Complete wiring diagrams showing all connections and internal wiring. Factory typical wiring diagrams are not acceptable.
  8. Operating and maintenance instructions.
  9. Warranty and guarantee information
  10. Substantial Completion documents to determine start of Warranty Period
- B. When individual Specification Sections call for close-out submission they may be combined on a master Project close-out USB flash drive with itemized files and sub-files for each Section.
- C. Additionally, submit one hard copy of the O&M's in a 3-ring binder and unfolded Record Drawings.
- D. Prior to release of final payment, Indiana State University must receive a complete set of record drawings in AutoCAD 2010 on a CD or DVD. The Design Engineer and the Indiana State University Department of Facilities Management engineering staff must approve these drawings.

COMMON WORK RESULTS FOR ELECTRICAL

## 1.06 COPPER REQUIREMENTS FOR ELECTRICAL EQUIPMENT

- A. All current-carrying components (phase, neutral and ground) of all electrical equipment shall be copper. No CUAL allowed without prior approval of Owner.
- B. Exceptions: molded case circuit breakers with in-built lugs and safety switches.

## 1.07 UNDERGROUND UTILITIES

- A. All underground utility lines shall be buried a minimum of 36" below finished grade.
- B. Place 3" of compacted red sand below all buried utility lines and cover with 12" of red sand.
- C. Remainder of the trench shall be back filled with new topsoil free of debris, compacted in 6" lifts to 98% standard proctor using the water jet method.
- D. Install the appropriate 6" wide marker tape a minimum of 12" above any buried utility line.

## 1.08 NEUTRAL RULES

- A. Neutral rules and requirements for multi-circuit branch raceway installations.
  - 1. A separate dedicated neutral shall be installed for every phase conductor in a multi-circuit 120-volt or 277-volt raceway.
  - 2. Neutrals shall be marked in such a way as to prevent the accidental crossing of neutrals at device locations.
  - 3. Neutrals in 120-volt applications shall be white, gray in 277-volt applications.
  - 4. This includes pre-wired raceway systems such as ISODUCT and systems furniture.
  - 5. No sharing of neutrals is allowed.
- B. Over sizing of neutral conductors shall not be allowed in lieu of the preceding rules and requirements.
- C. THESE RULES SUPERCEDE ANY OTHER NEUTRAL INSTRUCTIONS EITHER WRITTEN OR IMPLIED IN ANY OTHER SPECIFICATION SECTION OR SHOWN ON DRAWINGS.

## 1.09 RACEWAY SYSTEMS INSTALLATION SUMMARY

- A. Provide conduits, cable trays, surface raceways, boxes, fittings and supports to form a complete, coordinated, and continuously grounded raceway system.
- B. No more than three (3) single phase (120volt and 277volt) circuits shall be installed in a conduit raceway system.

## 1.10 RACEWAY REQUIREMENTS

- A. Conduits indoors in general areas shall be electrical metallic tubing (EMT) with steel set screw or compression fittings.
- B. Conduits indoors in hazardous areas, encased in concrete floorslabs or subjected to water, physical damage or abuse shall be galvanized rigid steel (GRS) or intermediate metal conduit (IMC) with cast or malleable iron threaded fittings and bushings.
- C. Conduits indoors for medium voltage distribution circuits or for fire pump feeders shall be galvanized rigid steel conduit with cast or malleable iron threaded fittings and bushings.
- D. Conduits outdoors shall be galvanized rigid steel or intermediate metal conduit with cast or malleable iron threaded fittings and bushings.
- E. Conduits encased in concrete underground shall be Type DB PVC for IT applications and Schedule 80 for MV applications both with matching fittings.
- F. Conduits direct buried underground shall be Schedule 40 PVC with matching fittings.

COMMON WORK RESULTS FOR ELECTRICAL

- G. Conduits in steam tunnels shall be galvanized rigid steel or intermediate metal conduit with cast or malleable iron threaded fittings and bushings. Exceptions to this requirement are tunnel segments inside building (i.e., mechanical rooms) where EMT may be used.
- H. Final connections to recessed lighting fixtures and under counter lights shall be 1/2" minimum flexible metallic conduit, manufactured wiring systems, or galvanized steel Type MC Cable all with steel fittings.
1. Manufactured wiring systems shall
    - a. Only be used above accessible ceilings.
    - b. Shall not be used in walls or above permanent ceilings.
    - c. Shall contain a dedicated, separate, grounding conductor.
  2. Type MC cable conductors shall be color coded to match the building color-coding scheme. Type MC Cable shall be terminated with steel setscrew connectors that have integral insulating bushings. Self-locking, twist-in type fittings are not acceptable.
- I. Final connections to motors, transformers and equipment subject to vibration or removal for maintenance shall be 1/2" minimum liquid tight flexible metallic conduit with steel liquid tight fittings. Transformer connections may be non-liquid tight flexible metallic conduit in electrical rooms only.
- J. Connections to recessed power receptacles and light switches in areas with accessible ceilings:
1. In new 'metal stud and gypsum board partitions (walls)' and in existing 'metal stud and gypsum board partitions (walls)', where the wall is not being otherwise opened up, the final connections may be made with type MC Cable. This MC Cable, shall:
    - a. Be run to a box immediately above the accessible ceiling, and the box size shall not exceed 4-11/16" square.
    - b. Conduit shall be used for the entire run, from this junction box, to the power source, load (lights), etc.
    - c. No more than three circuits may be run through any given junction box.
    - d. Individual conductors making up the MC cable shall be stranded copper, with separate grounding conductor, and steel corrugated armor. Individual conductors shall be color coded as required in section 16120.
    - e. The MC Cable is terminated using UL listed hardware intended for the cable and boxes being used, (and rated for commercial and industrial environments).
    - f. The MC Cable shall be secured in the wall cavity as required by NEC.
    - g. The MC Cable shall be as short as it is necessary to serve the need and meet the Code
- K. In areas with non-accessible ceilings devices shall be installed with standard conduit; run back in a continuous installation to a junction box located at an access point in the ceiling
- L. Connections to other recessed devices, (including communication outlet boxes, junction or pull boxes, etc) shall be with standard conduit of the type appropriate for the wall construction.
- 1.11 CABLE TRAY REQUIREMENTS
- A. Power and telecommunications cable trays shall be aluminum, ladder type, of the sizes shown on the drawings.
  - B. Center spline telecommunications cable tray may only be used where shown.
  - C. Changes in cable tray direction or elevation shall be made using standard fittings from the same manufacturer as the cable tray.
  - D. Barriers shall be installed in cable trays where shown to separate circuits of different voltage levels.

COMMON WORK RESULTS FOR ELECTRICAL

## 1.12 SURFACE RACEWAY REQUIREMENTS

- A. When conduits in finished areas cannot be concealed in walls or above ceilings, surface raceways may be used where permitted. Boxes and fittings shall match and be from the same manufacturer as the raceways.
- B. Raceway shall be metal and white in color unless otherwise noted on the drawings.
- C. Contractor shall verify with the Owner if the use of metal surface raceway is acceptable.

## 1.13 BOX REQUIREMENTS

- A. Provide sheet steel outlet boxes, extensions, and plaster rings for EMT, flexible metal conduit, and MC cable.
- B. Provide cast or malleable iron outlet boxes and covers for galvanized rigid steel conduits, intermediate metal conduits, and liquidtight flexible metal conduits.
- C. Boxes shall be sized for all conductors and devices to be contained within. Box extensions shall not be used to correct for undersized boxes. A single extension may be used as follows only if all free conductors extend at least 3 inches outside of the extension opening.
  - 1. On boxes being flush mounted in masonry walls.
  - 2. On existing boxes in walls that are being furred out.
  - 3. On existing boxes for connecting to an existing circuit.
  - 4. On fire alarm, security and clock system boxes where required by the system manufacturer's instructions.
- D. Plaster rings shall not be considered box extensions, but their capacities may be included in box fill calculations.

## 1.14 SUPPORT REQUIREMENTS

- A. Mechanical Areas and Tunnels
  - 1. Surface mounted equipment shall be secured to steel channels.
  - 2. Surface mounted raceway 1½" and smaller and boxes maybe attached directly to surfaces.
  - 3. Multiple raceway runs maybe attached to
    - a. A trapeze system with approved straps
    - b. Trapeze shall be attached to the structure by steel channels and threaded rod.
  - 4. Vertical surface race way 1½" maybe attached by:
    - a. Below 8' by one or two hole straps
    - b. 8" and above with pipe hangers ("Minerallac style hangers")
  - 5. The channels and raceway shall be attached with toggle bolts to hollow tile, block or similar surfaces, and attached with screws or bolts and expansion shields to solid masonry or concrete.
- B. Finished Areas Above Suspended Ceilings
  - 1. Raceway and boxes maybe attached directly to surfaces with appropriate straps or hangers.
  - 2. Multiple raceway runs maybe attached to
    - a. A trapeze system with approved straps
    - b. Trapeze shall be attached to the structure by steel channels and threaded rod.
  - 3. The channels and raceway shall be attached with toggle bolts to hollow tile, block or similar surfaces, and attached with screws or bolts and expansion shields to solid masonry or concrete.
  - 4. Attachment of raceway to ceiling grid support wires or rods is not permitted.

COMMON WORK RESULTS FOR ELECTRICAL

## C. Finished Areas Inside Walls

1. Raceway and boxes shall be attached to structural members with devices specifically designed for raceway/box attachment to the type of structural member used.

## D. Finished Areas Exposed

1. Surface raceway shall be attached to finished surfaces utilizing the factory approved method of attachment.
2. Tape is not acceptable for attachment of non-metallic surface raceway.

## PART 2 - PRODUCTS

## 2.01 CONDUITS

- A. Electrical metallic tubing shall be thin wall steel tubing, electro-galvanized or hot dipped galvanized inside and outside. Fittings and bushings shall be galvanized steel set screw type with two screws per connection for sizes over 2".
- B. Galvanized rigid steel conduit and intermediate metal conduit shall be hot dipped galvanized inside and outside, in 10' lengths and threaded on both ends. Fittings and bushings shall be cast or malleable iron, and hot dipped galvanized inside and outside.
- C. PVC conduit and fittings shall be Type DB for encasement in concrete for IT applications, Schedule 40 for direct burial, concealed and exposed work, and Schedule 80 in MV Duct Banks. Fittings shall be of the same type and from the same manufacturer as the conduit. PVC conduit shall be UL Labeled for 90 degrees C cables. Approved Manufacturers:
  1. Cantex
  2. Carlon
  3. National Pipe & Plastic.
- D. Flexible metallic conduit shall be galvanized steel or aluminum. Fittings shall be of steel with cadmium or galvanized finish. Fittings shall be machine screw clamp type, single or two-piece. Self-locking, twist-in type fittings are not acceptable.
- E. Liquid tight flexible metallic conduit shall consist of a flexible, galvanized steel core, a continuous copper ground strip and a polyvinyl chloride jacket. Fittings shall be steel liquid tight grounding type from the same manufacturer as the conduit.

## 2.02 CABLE TRAYS

- A. Ladder type cable tray shall be aluminum, of the width shown, with 4" rail height, 13/16" minimum rung width, and 9" maximum rung spacing. The tray with a 10' span shall be capable of sustaining a working load of 145 pounds per lineal foot with a load deflection of 1.0" when tested in accordance with NEMA VE1-3.01. Approved Manufactures:
  1. B-Line
  2. Chalfant
  3. Cope
  4. Globetray
  5. Husky
  6. Mono-Systems
  7. Square D
  8. Wiremold.
- B. Center spline cable tray shall be aluminum, of the width shown, with top mounted rungs, 3" load depth, 13/16" minimum rung width, and 9" maximum rung spacing. The tray with a 10' span shall be capable of sustaining a working load of 145 pounds per lineal foot with a load deflection of 1.0" when tested in accordance with NEMA VE1-3.01.



COMMON WORK RESULTS FOR ELECTRICAL

- C. Tray fittings including horizontal and vertical bends, tees, crosses, reducers, splice plates and expansion joints shall be from the same manufacturer and of the same product line as the tray. Bends, tees, crosses and reducers shall have a 13/16" minimum rung width, a 9" maximum rung spacing, and a 12" minimum bend radius.
- D. Tray fasteners shall be galvanized or zinc plated steel.

## 2.03 SURFACE RACEWAYS

- A. Where surface raceways are called for on the drawings, or when conduits in finished areas cannot be concealed in walls or above ceilings, surface raceways shall be used. Boxes and fittings shall match and be from the same manufacturer as the surface raceway.
- B. Surface raceways shall consist of a base and cover, sized for the number of conductors contained within, complete with all connectors, fittings, bushings, boxes, covers and mounting hardware.
- C. Raceways shall be 600 volt rated, and be in compliance with the applicable paragraphs of NEC Article 352.
- D. They shall be non-flammable, and UL labeled, under UL 5, or UL 5A (as applicable).
- E. The completed raceway system shall be vandal resistant.
- F. Shall accept receptacles, cover plates, telephone/data outlets and other standard wiring devices as specified elsewhere in these specifications.
- G. The coverplates used for wiring devices and telecommunication outlets shall be of the 'overlapping' type, and shall therefore cover the 'cut-end' of the raceway cover.
- H. The raceways shall have "scuff" resistant finish, and the raceways shall be paintable.
- I. All components of the raceway system exposed to view shall be of the same color and shade.
- J. Barriers shall be provided when necessary to separate conductors of different voltages, or services.
- K. Surface raceways shall be steel or plastic as noted below, and as noted on the drawings:
- L. Type Standards Manufacturers
  - 1. Metallic
    - a. Metallic raceways shall be of .040" thick (minimum) zinc plated or galvanized steel.
    - b. The acceptable levels of quality are, generically,
      - 1) Like "Wiremold V500 and V700" for smaller single channel raceway applications,
      - 2) Like "Wiremold V3000" for larger single channel raceway applications, and
      - 3) Like "Wiremold V4000" for larger multi-channel raceway applications.
    - c. Manufacturers include Wiremold, Hubbell, Thomas and Betts, or Mono-System.
  - 2. Plastic
    - a. Plastic raceways shall be of a material meeting all of the requirements of UL 5A, (including flammability, resistively structural strength, etc.).
    - b. The acceptable levels of quality are, generically,
      - 1) Panduit LD series, or Carlon Series 30 for smaller single channel raceway applications;
      - 2) Panduit Type T-70, or Carlon "Premiere", for larger single channel raceways, and smaller multi-channel raceways; and
      - 3) Panduit Twin 70 or Carlon "Prestige", for larger multi-channel raceway applications.
    - c. Manufacturers include Panduit, Carlon, Hubbell, Mono Systems, and Wiremold.

COMMON WORK RESULTS FOR ELECTRICAL

- M. Use vertical surface raceways from junction boxes above the ceiling, to the horizontal portion of the surface raceway. Locate vertical section as close to room corners (or 'vertical breaks' in mid wall) as is possible. Use of exposed vertical conduits is not acceptable.

## 2.04 BOXES

- A. Boxes for fixtures, outlets, switches, equipment connections and wire pulling shall be
1. Cast or formed from carbon steel sheets of commercial grade steel not less than 14-gauge,
  2. One-piece construction, zinc, or cadmium plated,
  3. Tapped for mounting plates and covers as required.
- B. Pull and junction boxes shall be
1. Fabricated from galvanized or painted code gauge cold rolled carbon steel sheets.
  2. Welded construction with flat removable covers fastened to the box with machine screws.
  3. Seams and joints shall be closed and reinforced with flanges formed of the same material from which the box is constructed or by continuous welding which will provide equivalent strength to flange construction.
  4. Preferably not provided with 'knockouts'.
- C. Box covers shall be fastened in place by machine screws or hinges and latches. Self-tapping or sheet metal fasteners are not acceptable.

## 2.05 SUPPORTS

- A. Hangers and brackets shall be made of steel pipe, channel iron, angle iron or prefabricated steel channel. Prefabricated steel channel shall be by B-Line, Hilti, Powerstrut or Unistrut.
- B. Anchors shall be lead shield anchors or plastic expansion anchors for small loads, and expansion or epoxy anchors for large loads. Powder-driven anchors shall not be used.

## 2.06 LABELS AND DIRECTORIES

- A. Equipment nameplates shall be engraved .125 inch (1/8") thick 'Lanaloid' (Lanacoid) plastic. White, with black letters. The engraved letters shall be at least one quarter inch (1/4") high.
- B. Receptacles and lighting switch covers shall be labeled using clear adhesive backed nylon or Mylar tape with black text permanently laminated to the tape.
- C. Panel directories shall be typed on supplied card stock with panel, or card stock similar in thickness and material as those supplied with the panels. Install supplied clear plastic cover, or one of like material.

## PART 3 - EXECUTION

## 3.01 GENERAL

- A. All work shall conform to all applicable Codes and Construction Standards.
- B. All installations shall be warranted for a period of one (1) year against defects in material and workmanship.
- C. The Owner reserves the right to relocate any device fifteen (15) feet prior to installation at no additional cost.
- D. Material Storage
1. All materials shall be new and in original factory packaging.
  2. All material shall be kept dry and clean.
  3. The Owner reserves the right to reject any material not properly stored.

COMMON WORK RESULTS FOR ELECTRICAL

- E. Contractor shall swab clean the interior of all raceway prior to pulling wire.
- F. Device plate screw slots shall be oriented vertically.

**3.02 RACEWAYS**

- A. Size conduits in accordance with the NEC, but not less than the sizes shown on the drawings. Minimum power, fire alarm and control conduit size shall be ¾". Minimum telecommunications conduit size shall be 1".
- B. Install concealed and exposed conduits and cable trays parallel to or at right angles to building lines. Conduits shall not be embedded in concrete slabs except where specifically shown. Install surface raceways as close to room corners or trim features as possible to make the surface raceways less obvious.
- C. Make directional changes in primary power distribution conduits above ground with sweeps and long radius elbows, and underground with 20' minimum radius bends.
- D. Conceal conduits wherever possible and practical. When conduits cannot be concealed in finished areas, use surface raceways with matching boxes from the same manufacturer as the raceways.
- E. Metal conduits, fittings, enclosures and raceways shall be mechanically joined together in a firm assembly to form a continuous electrical conductor providing effective electrical grounding continuity.
- F. Provide expansion fittings at the intervals specified in the manufacturer's instructions.
- G. Conduits entering panels located outdoors, in parking structures, in steam tunnels and on cooling towers shall enter from the sides, back, or bottom. Conduits shall not enter from the top.
- H. Separate raceways from uninsulated steam pipes, hot water pipes, and other hot surfaces by a minimum of 4" horizontally or 12" vertically. Separate raceways from ventilation ducts and insulated pipes so that they do not come into contact with each other.
- I. Low voltage signal circuits shall be separated or shielded from power circuits to prevent the induction of noise into the signal circuits.
- J. EMT entering sheet metal enclosures and outlet boxes shall be secured in place by a connector with a locknut. Rigid conduit shall be secured with locknut inside and outside and a bushing. Sufficient thread on the connector or conduit shall extend into the enclosure so that the bushing will butt tight into the connector or conduit. Bushings shall not be used as jamb nuts or in lieu of locknuts.
- K. Flexible metallic conduit to motors and similar equipment shall not exceed 3'-0" in length, and shall have adequate slack to absorb the maximum vibration. Flexible conduit connections to lighting fixtures shall not exceed 6'-0" in length.

**3.03 MOUNTING HEIGHTS**

- A. Except where shown otherwise, install equipment and devices at the following heights:
  - 1. Receptacles (Wall): 18" A.F.F. to center
  - 2. Receptacles (Above Counter): 48" A.F.F. to center or 4" minimum above countertop or backsplash.
  - 3. Receptacles (Unfinished Area): 48" A.F.F. to center
  - 4. Surface Raceway Receptacle Strips: 42" A.F.F. to bottom
  - 5. Light Switches: 48" A.F.F. to center
  - 6. Telephone Outlets (Wall Phone): 48" A.F.F. to center
  - 7. Telephone/Data Outlets: 18" A.F.F. to center

COMMON WORK RESULTS FOR ELECTRICAL

8. Clock Outlets: 88" A.F.F. to center
9. Fire Alarm Pull Stations: 45" A.F.F. to center
10. Fire Alarm Horn/Strobes: 80" A.F.F. to bottom or 1' below finished ceiling whichever is lower.
11. Card Readers: 48" A.F.F. to card slot
12. Security System Controls: 48" A.F.F. to center
13. Thermostats/HVAC Controls: 48" A.F.F. to center
14. Panelboards: 72" A.F.F. to top
15. Safety Switches/Motor Starters: 72" A.F.F. to top (except top of handle shall not exceed 78" A.F.F.)
16. Motor Control Pushbuttons: 60" A.F.F. to center
17. Verify with the Owner for heights not otherwise listed.

## 3.04 SUPPORTS

- A. Provide 4" thick concrete housekeeping pads for floor-mounted equipment.
- B. Support all electrical items independently of supports provided by the other trades.
- C. Support conduits and boxes using steel conduit straps or 1/4-inch minimum diameter threaded rod hangers. Suspended ceiling hangers or hanger wire shall not be used (except to support flexible metallic conduit and manufactured wiring systems).
- D. Support cable trays with support brackets or 3/8" diameter minimum threaded rod hangers at intervals not exceeding 8'-0" for straight runs. Additional supports shall be provided at tray fittings.
- E. Hangers shall be of sufficient strength that their deflection at mid span does not exceed 1/240 of the hanger span length after the cables are installed.
- F. Route flexible metallic conduit, manufactured wiring systems and Type MC cable parallel to or perpendicular to building lines, and in a neat and workmanlike manner. Coil the excess manufactured wiring systems and Type MC cable, and support independently of the ceiling grid system at intervals not exceeding 3 feet.

## 3.05 PENETRATIONS, SLEEVES AND FIRE SEALS

- A. Cut floor and wall penetrations neatly and to the minimum size required for installation of the equipment and raceways.
- B. Provide galvanized steel pipe sleeves for all conduits penetrating floors, exterior walls and roofs.
  1. Extend floor sleeves above the floor a minimum of 2 inches.
  2. Embed sleeves in new concrete or step-core concrete and grout sleeves into existing concrete with epoxy grout.
  3. Seal floor sleeves using fire-sealing systems approved by a Nationally Recognized Testing Laboratory.
  4. Seal exterior wall and roof penetrations water tight.
- C. Patch both sides of wall penetrations cut for electrical equipment and raceways to seal against the passage of air, sound and fire.
  1. Seal cable tray penetrations in fire rated walls using fire sealant bags approved by a Nationally Recognized Testing Laboratory.
  2. Seal conduit penetrations in fire rated walls using firesealing caulk approved by a Nationally Recognized Testing Laboratory.

COMMON WORK RESULTS FOR ELECTRICAL

3. Seal conduit penetrations in non-rated walls using masonry materials that match the wall construction.
4. Fire seal between recessed outlet boxes located on opposite sides of a fire rated wall if the box openings are over 16 square inches and the boxes are less than 24 inches apart.

3.06 EXPANSION FITTINGS

- A. Provide expansion fittings at all building expansion joints.
- B. Provide expansion fittings, in accordance with manufacture recommendations, in all areas subject to swings in temperature of more than 15 degrees C.
- C. Install expansion fittings in all locations were expected expansion difference is  $\frac{1}{4}$ ", or more, between boxes

3.07 IDENTIFICATION

- A. Provide nameplates and labels in accordance with Article 2.6.
  1. Lanaloid labels shall be mechanically secured in place with sheet metal screws and/or bolts and nuts
  2. Labels shall be neatly centered. Place labels in like positions on similar equipment.
- B. Color code wiring as noted in Section 26 05 19 3.01 B
- C. Color code junction boxes and box covers of
  1. Emergency power circuits with red paint
  2. Fire alarm circuits with red paint.
  3. Temperature control circuits with blue paint.
  4. Phone and Data circuits with orange paint.

END OF SECTION 26 05 00

26 05 00

COMMON WORK RESULTS FOR ELECTRICAL

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26 05 02  
SELECTIVE ELECTRICAL DEMOLITION

PART 1 – GENERAL

1.01 SCOPE OF WORK

- A. Demolition of electrical items and associated materials as indicated herein or as indicated on the drawings.

1.02 SECTION INCLUDES

- A. Removal of designated equipment and devices.
- B. Removal of designated construction.
- C. Disposal or storage of removed materials.
- D. Identification of utilities.
- E. Refer to items as indicated.

1.03 SUBMITTALS FOR CLOSEOUT

- A. Project Record Documents: Accurately record actual locations of terminated utilities and subsurface obstructions.

1.04 REGULATORY REQUIREMENTS

- A. Conform to applicable code for demolition work, safety of structure, dust control, products requiring electrical disconnection and re-connection.
- B. Obtain required permits from authorities.
- C. Do not close or obstruct egress width to any building or site exit.
- D. Do not disable or disrupt building fire or life safety systems without 3 days prior written notice to Owner.
- E. Conform to procedures applicable when hazardous or contaminated materials are discovered.

1.05 SCHEDULING

- A. Perform work between the hours of 7 a.m. and 7 p.m.

1.06 PROJECT CONDITIONS

- A. Conduct demolition to minimize interference with adjacent and occupied areas.
- B. Maintain protected egress and access to the Work.

PART 2 – NOT USED

PART 3 – EXECUTION

3.01 PREPARATION

- A. Protect existing materials which are not to be demolished.
- B. Notify affected utility companies before starting work and comply with their requirements.
- C. Utilize OSHA lockout/tag-out procedures for disconnecting means.
- D. Label all wiring to remain (phase and device fed) to assure proper re-connection.
- E. Mark location and termination of utilities.

3.02 DEMOLITION

- A. Disconnect, remove, cap, identify designated utilities to remain and demolish in an orderly and careful manner.
- B. Remove demolished materials from site except where specifically noted otherwise.

SELECTIVE ELECTRICAL DEMOLITION

- C. Remove materials as Work progresses. Upon completion of Work, leave areas in clean condition.

3.03 PROTECTION OF SALVAGED ITEMS

- A. Remove, store and protect the materials and equipment scheduled to be re-used.
- B. Protect wiring to be re-used by means of a Junction Box
  - 1. Junction Box shall be of sufficient size to permit reconnection of existing wiring to new wiring per NEC Requirements.
  - 2. In outdoor locations the junction box shall be NEMA 3R or a custom junction box with welded seams and gasketed cover.

END OF SECTION 26 05 02



26 05 19  
LOW VOLTAGE WIRE AND CABLE

PART 1- GENERAL

1.01 DESCRIPTION OF WORK

- A. Extent of electrical wire and cable work is indicated by the Project drawings.
- B. Types of wire, cable and connectors in this section include the following
  - 1. 600 volt insulated copper conductors
  - 2. Twist on insulated metal spring connectors
  - 3. Compression connectors
  - 4. Split Bolt connectors

1.02 QUALITY ASSURANCE

- A. Manufacturers: Firms regularly engaged in manufacture of electrical wire and cable of types sizes and ratings required, whose products have been in satisfactory use in similar service for not less than five (5) years.
- B. Installers: Firm with at least five (5) years of successful installation experience with projects utilizing electrical wiring and cabling work similar to those required for this Project.
- C. NEC Compliance: Comply with NEC requirements as applicable to construction, installation and color coding of electrical wires and cable.
- D. U.L. Compliance: Comply with applicable requirements of UL Standard 83, "Thermoplastic-Insulated Wires and Cables", and UL Standard 486A, "Wire Connectors and Soldering Lugs For Use With Copper Conductors".
- E. UL Labels: Provide wire, cable and connectors which are UL listed and labeled.

1.03 DELIVERY, STORAGE AND HANDLING

- A. Deliver wire and cable properly packaged in factory-fabricated type containers or wound on NEMA Specified type non-returnable wire and cable reels.
- B. Store wire and cable in a clean dry space. Protect products from weather, damaging fumes, construction debris and traffic.
- C. Handle wire and cable carefully to avoid abrading, puncturing, or tearing wire and cable insulation and sheathing. Ensure that dielectric resistance integrity of wire and cable is maintained.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufactures offering products which may be used on this Project include, but not limited to, the following:
  - 1. Low Voltage Wire:
    - a. American Insulated Wire and Cable
    - b. Southwire Company
    - c. Others as Approved

LOW VOLTAGE WIRE AND CABLE

2. Electronic Cable
    - a. Belden
    - b. Alpha
    - c. Anixter
  3. Twist on insulated metal spring connectors
    - a. Ideal
    - b. Thomas and Betts Corp
    - c. 3M Company
  4. Compression
    - a. Square D / Anderson
    - b. Thomas and Betts
- 2.02 DESCRIPTION THHN / THWN
- A. Conductor:
    1. Bare, soft annealed copper per ASTM B-3.
    2. Sizes 14 - 10 AWG: Solid, bunched, unilay concentric combination unilay or compressed stranded (class C) alternate ASTM B-787, ASTM B-3 or ASTM B-8 and UL-83.
    3. Sizes 8 - 2 AWG: Concentric, compressed stranded (class C) alternate ASTM B-787, ASTM B-8, UL-83 and UL-1063.
    4. Sizes 1 AWG - 750 KCMIL: Concentric, compressed stranded (class B) ASTM B-8, UL-83 and UL-1063.
  - B. Insulation:
    1. High dielectric polyvinyl chloride (PVC) per UL-83 and UL-1063.
    2. Overall Jacket: Nylon per UL-83 and UL-1063.
  - C. Cable Identification:
    1. Ink print on jacket for Sizes 14 - 10 AWG (solid conductors): "(size) AWG Type THHN or THWN GAS AND OIL RES II 600V(UL) or AWM VW-1---(Company Name).---C-UL Type T90 NYLON or TWN 75"
    2. Ink print on jacket for Sizes 14 AWG - 750 KCMIL (stranded): "(size) AWG (or KCMIL) Type MTW or THHN or THWN or GAS AND OIL RES II 600V (UL) or AWM---(Company Name).---C-UL Type T90 NYLON or TWN 75."
    3. Also "VW-1" and "FT1" on sizes 14 through 6 AWG and "for CT USE SUN RES" on sizes 1/0 AWG and larger in black.
  - D. Cables conform to the following standards:
    1. UL-83 for THHN-THWN, UL-1063 for MTW (stranded conductors only)
    2. Federal Specification J-C-30B, NEMA WC-5, UL-758 for AWM Styles 1316 through 1321, 1408 through 1414, 1452 and 1453.
- 2.03 ELECTRONIC CABLE - COMMUNICATION AND SIGNAL
- A. Shall conform to the recommendations of the manufacturers of the communication and signal systems; however, not less than what is shown.

LOW VOLTAGE WIRE AND CABLE

- B. Wiring shown is for typical systems. Provide wiring as required for the systems being furnished.
- C. Multi-conductor cables shall have the conductors color coded.

2.04 CABLES AND CONNECTORS

- A. General: Provide electrical cables and connectors of Manufacturer's standard materials, as indicated by published product information.
- B. Provide copper conductors with conductivity of not less than 98% at 68° F (20° C).
- C. Electronic cable shall be Plenum rated and as recommended by the Equipment Supplier
- D. Connectors shall be for copper to copper connections
- E. Insulation: All connectors shall be fully insulated to match insulation type and rating of conductors being spliced.

PART 3 – EXECUTION

3.01 INSTALLATION OF WIRES AND CABLES

- A. General: Install electrical cables, wires and wiring connectors as indicated, in compliance with applicable requirements of NEC, NEMA, UL and NECA's "Standard of Installations", and in accordance with recognized industry practices.
- B. Feeder phase identification from left to right or front to back facing front of equipment shall be one of the following:

Phase A	Phase B	Phase C	Neutral	System
X	Y	Z	N	Any voltage
BLACK	RED	BLUE	WHITE	120/208 volt feeders
BROWN	ORANGE	YELLOW	GRAY	277/480 volt feeders

- C. Install all wiring in conduit except as indicated on the drawings or directed by Owner.
- D. Pull conductors together where more than one is being installed in a raceway.
- E. Use pulling compound or lubricant where necessary. Compound must not deteriorate conductor or insulation. Use of soap is not permitted as a pulling lubricant.
- F. Pulling means must not damage cable or raceway.

3.02 COMPRESSION CONNECTORS

- A. Use only compression indenter tools designed for the type of connector used.
- B. For multiple indentations start at center and indent outward.

3.03 FIELD QUALITY CONTROL

- A. Prior to energizing, test all cables and wires with "Megger" to determine insulation resistance levels to ensure insulation integrity.
- B. Prior to energizing, test wires and cables for electrical continuity and for short circuits.

END OF SECTION 26 05 19

26 05 19  
LOW VOLTAGE WIRE AND CABLE

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26 05 26  
GROUNDING AND BONDING

PART 1 - GENERAL

1.01 SUMMARY

- A. Provide grounding for all systems and equipment.

1.02 GROUNDING SYSTEM REQUIREMENTS

- A. Each ground rod shall have a maximum resistance to ground of 10 ohms before connection to the other ground rods. If reading is above 10-ohms, drive one extension. Further testing of that individual rod is not needed.
- B. The total grounding system with all connections completed shall have a maximum resistance to ground of 2 ohms for primary services or 5 ohms for secondary services.

1.03 CONNECTION REQUIREMENTS

- A. Provide exothermic weld type, or Burndy Hyground, ground connections for concealed, underground, and concrete encased ground connections, for ground connections to structural steel, connections between sections of the main ground bus and all connections to the substation room ground bus bars.
- B. Exposed ground connections (except connections to structural steel and substation room ground bus bars) may be made with copper or bronze compression ground fittings or bolted compression ring lugs.
- C. Provide exothermic weld type, or Burndy Hyground ground connections for splices and taps of grounding conductors No. 8 AWG and larger. Exposed splices and taps shall be taped.

PART 2 - PRODUCTS

2.01 GROUND RODS

- A. Unless shown otherwise, ground rods shall be 3/4" diameter by 10' long, copper clad steel. Ground rods shall be capable of being extended when additional length is required.

2.02 GROUNDING CONDUCTORS

- A. Grounding conductors for direct burial underground, for encasement in concrete, and for grounding of unit substations shall be No. 4/0 AWG minimum, bare, stranded copper.
- B. Grounding conductors for general use shall be stranded, copper conductor, sized in accordance with the NEC unless shown otherwise on the drawings, and insulated with green NEC Type THHN insulation rated 90 degrees C, 600 volts.

2.03 GROUND CONNECTIONS

- A. Ground connections shall be Burndy Hyground, Cadweld, Thermo-weld or Thomas & Betts Blackburn only.

PART 3 - EXECUTION

3.01 INSTALLATION REQUIREMENTS

- A. Ground duct banks and manholes in accordance with Specification Section 26 05 13
- B. Provide bare copper grounding conductors from duct banks, manholes, unit substations, primary switches, transformers, switchgear, panelboards, motor control centers and control panels to the building grounding system. Equipment rated above 480 volts or 600 amps shall be grounded by a minimum of two independent grounding conductors.
- C. Bond transformer, UPS system, central battery/inverter system, emergency generator, and separately derived electrical system neutrals to the building grounding system.
- D. Ground motors rated 460 volts and below by motor feeder equipment grounding conductors. Stranded copper grounding conductors connected to building steel shall also bond motors rated over 460 volts.

GROUNDING AND BONDING

- E. Provide green insulated equipment grounding conductors in all service, feeder, and branch circuits for connection of load devices to the power source ground. Raceways shall not be used as equipment grounding conductors.
- F. Equipment grounding conductors shall not be daisy-chained.
- G. Bond equipment-grounding conductors in boxes and enclosures where the grounding conductors are terminated or spliced.
- H. Bond conduits, cable trays, wireways, surface raceways, boxes, and enclosures together, and to the building grounding system. Provide bonding bushings and bonding jumpers to bond conduits where they enter a box or enclosure.
- I. Ground the lightning protection system with separate ground rods. The building grounding system ground rods shall not be used. After completion of both systems, the lightning protection system shall be bonded to the building grounding system.
- J. Protect separately routed grounding conductors subject to damage or physical abuse by Schedule 40 PVC nonmetallic conduits. Grounding conductors shall not be routed in metallic conduits except when routed with phase conductors.

END OF SECTION 26 05 26

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RACEWAY AND BOXES

PART 1 – GENERAL

1.01 SUMMARY

- A. This Section specifies raceways and boxes for building and structure electrical systems under 600 volts.
- B. Provide all labor, materials, and equipment as necessary to complete all work as indicated on the drawings, and as specified herein.
- C. Related Sections:
  - 1. Division 01 - General Requirements
  - 2. Applicable sections of Division 26 - Electrical

PART 2 – PRODUCTS

2.01 GENERAL INFORMATION

- A. All boxes, brackets, bolts, clamps, etc., shall be galvanized or electro-galvanized.
- B. All hardware used outdoors shall be hot dipped galvanized.

2.02 CONDUIT

- A. Rigid galvanized conduit shall be installed in poured concrete slabs, walls and partitions. Rigid or I.M.C. shall be installed in damp locations and inaccessible places.
- B. All rigid conduit, I.M.C. and E.M.T. shall be hot dipped galvanized or electro-galvanized.
- C. E.M.T. may only be installed exposed, above suspended ceilings, or in partitions.
- D. Flexible steel conduit may be used for short runs to individual pieces of equipment.
- E. Flexible sheathed metallic conduit shall be used for runs less than 6' in length to individual pieces of equipment in mechanical rooms, penthouses, etc.
- F. MC Cable is permitted in existing walls where installation of EMT is not possible to devices
- G. No E.M.T. or aluminum conduit shall be used in concrete, direct burial or in corrosive locations.
- H. Aluminum conduit may only be used in sizes 1-1/2 inch and larger. No aluminum conduit will be permitted in concrete. When aluminum conduit is used, all bends shall be galvanized steel.
- I. Size and type of conduit shall comply with the National Electric Code. Where conduits are indicated on the drawing to be larger than required by Code, the larger conduit shall be used.
- J. Minimum conduit size shall be 3/4 inch in all runs.

2.03 PULL AND JUNCTION BOXES

- G. All pull boxes shall be galvanized sheet steel, sized as required, with thickness not less than no. 14 gauge.

2.04 OUTLET BOXES

- A. All outlets, except as otherwise specified, shall consist of approved galvanized steel boxes of pattern adapted to the special requirements of each outlet, securely fastened in place in an approved manner.

PART 3 – EXECUTION

3.01 CONDUIT

- A. Conduit shall be concealed in all new walls and run above suspended ceilings.
- B. Use Wiremold type metal raceway where necessary to run exposed on existing walls and/or ceilings in finished areas as shown on the drawings.
- C. All conduit shall be fastened or suspended from structural members, slabs, or walls only. It shall

26 05 33  
RACEWAY AND BOXES

not be run on or fastened to tee bars of suspended lay-in ceilings.

- D. All conduit shall be supported by approved hangers at spaced per NEC.
- E. All exposed conduit shall be run parallel to the structural members of the building in a neat manner, securely fastened in place.
- F. When metal conduit extends below the bottom of a slab on the ground, the slab shall be thickened in the area of the conduit so as to encase the conduit in concrete by at least 2 inches on all sides. The responsibility for and expense of this work shall be borne by the Contractor.

3.02 OUTLET BOXES

- A. Recessed outlet boxes for single gang or 2-gang installations shall be 4" square with appropriate device ring or plaster ring for the required number of devices.
  - 1. All device rings and plaster rings shall be installed vertically unless instructed otherwise by the A/E or Owner.
  - 2. All plaster rings shall not extend past flush with wall surface or be recessed more than 1/4" from wall surface.
  - 3. For installations of more than two devices use the appropriate wall box for the number of devices required. If approved by the Owner the use of gangable wall boxes is allowed.
  - 4. For surface installations in Mechanical Area or similar locations 4" square boxes shall be used with 1/4" raised cover.

3.03 PULL AND JUNCTION BOXES

- A. Pull boxes shall not be installed in inaccessible locations.

END OF SECTION 26 05 33



26 09 23  
LIGHTING CONTROLS

PART 1 – GENERAL

1.01 SCOPE

- A. The Contractor shall furnish and install a lighting control as specified and as shown on the contract drawings.

1.02 RELATED SECTIONS

- A. Section 26 05 00 Common Work Results for Electrical
- B. Section 26 05 19 Low Voltage Wire and Cable
- C. Section 26 05 33 Raceway and Boxes
- D. Section 26 51 00 Interior Lighting

1.03 SUBMITTALS -- FOR REVIEW/APPROVAL

- A. The following information shall be submitted to the Architect/Engineer and Owner
  - 1. Manufacturer's product cut-sheet
- B. Submit electronically in PDF format.

1.04 SUBMITTALS -- FOR INFORMATION

- A. When requested by the Engineer the following product information shall be submitted:
  - 1. Descriptive bulletins
  - 2. Product sheets.
- B. Submit electronically in PDF format.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Equipment shall be handled and stored in accordance with manufacturer's instructions. One (1) copy of these instructions shall be included with the equipment at time of shipment.

1.06 OPERATION AND MAINTENANCE MANUALS

- A. One (1) paper copy and one (1) USB flash Drive of the equipment operation and maintenance manuals shall be provided.
- B. Operation and maintenance manuals shall include the following information:
  - 1. Instruction books and/or leaflets
  - 2. Recommended renewal parts list
  - 3. Drawings and information required by section 1.06.

PART 2 – PRODUCTS

2.01 TIME CLOCK

- A. Manufacturers
  - 1. Paragon
  - 2. Tork

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LIGHTING CONTROLS

B. Ratings

1. Like Paragon Model EC71st /120V Electronic Sun Tracker
2. 120 volt ac control voltage
3. Single Channel control
4. Contact Rating, 15 amp
5. NEMA 1 enclosure

2.02 PHOTOCONTROL

A. Manufacturers

1. Tork
2. Precision

B. Ratings

1. Weatherproof Lexan® housing
2. Photocell: 1 inch cadmium sulfide light sensitive element.
3. Turn on: 1 to 3 foot-candles. External light level slide allows field adjustment between 3 to 10 foot-candles.
4. Turn on / turn off ratio 1:3
5. Minimum 15 second time delay.
6. Single-pole, single-throw switch. Contact position at night normally closed.
7. Temperature Range -40 to 158 degree F
8. ½"-14 threaded stem.

2.03 LIGHTING CONTACTOR

A. Manufacturers

1. ASCO
2. Cutler Hammer
3. Square D

B. Ratings

1. 30 amp minimum
2. Number of poles as required
3. Control/coil voltage 120 volt
4. Electrical held
5. Installed in NEMA 1 enclosure or as required for location.

2.04 OCCUPANCY SENSORS

A. Wall Mounted

1. Wall Mounted occupancy sensors shall be a multi-technology (Ultrasonic & PIR) wall switch that turns lights on and off based upon occupancy and ambient light levels. Type 2 sensors shall contain two separate relays and manual override controls for dual level switching of light fixture. Sensors shall have built-in light level sensor, adjustable time delays, zero crossing switching, and smart technology. Provide necessary device box. Type 1 sensors shall be Hubbell Building Automation #LHMTS1 or pre-approved equal. Type 2 sensors shall be Hubbell Building Automation #LHMTD2 or pre-approved equal. Color of devices shall be as selected by owner but generally shall match color of wiring devices.

26 09 23  
LIGHTING CONTROLS

B. Ceiling Mounted

1. Ceiling Mounted occupancy sensors, indicated by OS on plans, shall be a multi-technology (ultrasonic & PIR) sensor that turns lights on and off based upon occupancy. Sensor shall have adjustable time delays, zero crossing switching, and smart technology. Provide necessary back-box. Sensor shall be Hubbell Building Automation #OMNIDT2000 or pre-approved equal.

C. Power Packs and Relays

1. The power packs shall provide both the 24VDC power supply to operate sensors as well as the 20 amp line voltage relay to control the load. Power pack shall be mounted to a junction box located above accessible ceiling. Housing shall be plenum rated. Power packs shall be Hubbell Building Automation #UVPP Universal Voltage Power Pack, or pre-approved equal.

2.05 WALL BOX DIMMERS

- A. Wall box dimmers shall be Leviton Renoir II series or approved equal.
- B. Shall be compatible with light fixture/driver and shall be capable of multi-location applications.

2.06 COMBINATION WALL BOX DIMMER AND OCCUPANCY SENSOR

- A. Wall box device providing both digital PIR occupancy sensor and 0-10V dimming shall be Hubbell LHDMIRS-3 series or approved equal.
- B. 3 buttons provide on/off, raise and lower light levels.

2.07 ELECTRONIC WALL BOX TIMERS

- A. Timer shall be like Hubbell DT300 or Legrand TS-400
  1. Multiple timer intervals
  2. Energy code presets for Title 24, IECC, and ASHRAE 90.1
  3. Visual and audio turnoff warning
  4. 3 Way and Multiple Way Switching
  5. No Neutral Required
  6. No Load Requirement
- B. Do not use in unconditioned spaces where temperature may fall below 30 degrees F.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. The Contractors shall install all equipment per the manufacturer's recommendations and the contract drawings.
- B. Protect the equipment from damage and keep clean and dry during construction.
- C. **Installation of in wall switch replacement occupancy sensors must be approved by the Owner.**
- D. Install power packs above accessible ceilings and locate near door to room. If space has no ceiling, install power pack within a minimum 4" square junction box and locate near the door to the room, as neatly as possible. Coordinate with manufacturer.

END OF SECTION 26 09 23

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LIGHTING CONTROLS

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WIRING DEVICES

## PART 1 – GENERAL

## 1.01 DESCRIPTION OF WORK

- A. Types and locations of wiring devices are indicated by the Project drawings.
- B. Types of wiring devices in this section include the following
  - 1. Receptacles
  - 2. Switches
  - 3. Cover plates

## 1.02 QUALITY ASSURANCE

- A. Manufacturers: Firms regularly engaged in manufacture of wiring devices, whose products have been in satisfactory use in similar service for not less than five (5) years.
- B. Installers: Firm with at least five (5) years of successful installation experience with projects utilizing wiring device work similar to those required for this Project.
- C. NEC Compliance: Comply with NEC requirements as applicable to construction, installation and coding of wiring devices.
- D. UL Labels: Provide wiring devices that are UL listed and labeled.

## 1.03 DELIVERY, STORAGE AND HANDLING

- A. Deliver wiring devices properly packaged in factory-fabricated type containers.
- B. Store wiring devices in a clean dry space. Protect products from weather, damaging fumes, construction debris and traffic.

## PART 2 – PRODUCTS

## 2.01 GENERAL

- A. General use receptacles shall be heavy-duty 20-amp duplex 2 pole 3 wire grounding type.
- B. All switches shall be specification grade quiet switches, 120-277 volt 15 amp.
- C. Device colors shall be a selected by the Owner but generally all devices shall be white on painted walls and brown on wood walls unless for special application.
- D. Devices on emergency circuits shall be red.
- E. All exterior receptacles and any receptacle within six (6) feet of any water shall be GFCI.

## 2.02 MANUFACTURERS AND CATALOG NUMBERS

- A. Hubbell, legrand, Leviton and Pass & Seymour are the only acceptable manufacturers.
- B. The following is an approved list of receptacles by type (based on Hubbell).
  - 1. 20 amp duplex- # HBL5362 or approved equal
  - 2. 20 amp isolated ground- #IG5362 (orange) or approved equal
  - 3. 20 amp single- # HBL5461 or approved equal
  - 4. 20 amp duplex with two USB charging ports- # USB20X2 or approved equal
  - 5. 20 amp GFCI - # GFR5362SG or approved equal

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WIRING DEVICES

- C. The following is the approved list of switches by type 15 amp (based on Hubbell).
1. Single pole toggle switch-# HBL1201 or approved equal
  2. 2 pole toggle switch - # HBL1202 or approved equal
  3. 3 way toggle switch-# HBL1203 or approved equal
  4. 4 way toggle switch- # HBL1204 or approved equal
  5. Single pole key switch with key- # HBL1201L
  6. 2 pole key switch with key- # HBL1202L
  7. 3 way key switch with key- # HBL1203L
  8. 4 way key switch with key- # HBL1204L
  9. Maintained contact 3 position, 2 circuit, center off, single pole, double throw 20 amp- # HBL1385
  10. Momentary contact 3 position, 2 circuit, center off, 20 amp- # HBL1557
- D. All interior device cover plates are to be polycarbonate type (thermoset plastic not allowed), color to match device color unless otherwise noted.
- E. All exterior device cover plates shall be weatherproof type unless otherwise noted.

PART 3 - EXECUTION

3.01 INSTALLATION OF WIRING DEVICES

- A. General: Install wiring devices as indicated, in compliance with applicable requirements of NEC, NEMA, UL and NECA's "Standard of Installations", and in accordance with recognized industry practices.
- B. Install all wiring in approved boxes or enclosures.
- C. For vertically install receptacles with ground up and on horizontal receptacles the ground on the left.
- D. Verify proper orientation of all switches
- E. Cover plates must cover all openings around devices and boxes.
- F. All devices must be installed plumb with the surroundings
- G. All device cover plate screws slots shall be vertical.

END OF SECTION 26 27 26

26 51 00  
INTERIOR LIGHTING

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General, Supplementary, and Special Conditions apply to all lighting installations.
- B. Section 26 05 00 Common Work Results Electrical
- C. Section 26 05 33 Raceway and Boxes
- D. Section 26 05 19 Low Voltage Wiring
- E. Section 26 09 23 Lighting Controls

1.02 REQUIREMENTS OF WORK

- A. The Basic Electrical Requirements apply to all electrical materials, equipment, installations and services supplied under Dimmer package.
- B. The Electrical Contractor shall obtain a Bill of Materials from the Lighting Supplier(s) listed herein or proposed for substitution. The Bill of Materials shall be submitted with the Contractor's bid and shall include, but not limited to, the following.
  - 1. All lighting fixtures
  - 2. All fixture accessories
  - 3. Number, fixture type and luminaire type to be provided
- C. The Electrical Contractor (Sub-Contractor) and the Lighting Supplier(s) are responsible for the installation of a complete and operating lighting system in accordance with the intent of the Contract Documents.

1.03 SUBMITTALS

- A. The following items shall be submitted for approval prior to ordering.
  - 1. Lighting Fixtures
- B. All submittals shall be submitted electronically in PDF format

1.04 INSTALLER QUALIFICATIONS

- A. A firm with at least five (5) years of successful installation experience on projects with electrical works similar to this project.

PART 2 – PRODUCTS

2.01 FIXTURE SCHEDULE

- A. See fixture schedule on Drawings.

PART 3 – EXECUTION

3.01 GENERAL

- A. All equipment shall be installed in a workmanlike manner and shall conform to industry Standards for this type on installation.
- B. All fixtures shall be plumb and square with ceilings and walls

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INTERIOR LIGHTING

- C. Support for fixtures in or on a grid type ceiling. Use grid for support.
  - 1. Install grid support wires on all four corners of each fixture.
  - 2. Install support wires or support chains, minimum of two, independent of the ceiling grid to each fixture not more than 6 inches from the corner on diagonally opposite corners of each fixture.
- D. Flange mounted fixture installation shall be per Manufacturer's instruction.

3.02 TESTING

- A. "Megger" all wiring prior to energizing.
- B. Test all switches and sensors for proper operation
- C. Verify proper operation of each fixture.
- D. Test each emergency fixture by interrupting the power to the fixture.

3.03 CLOSEOUT

- A. Prior to final acceptance and Project closeout the Contractor shall:
  - 1. Clean all fixtures and lenses inside and outside
  - 2. Replace any burned out lamps or LED arrays.

3.04 WARRANTY

- A. As Specified on each individual fixture listed herein.
- B. In lieu of a specific fixture warranty, all parts and labor on this Project shall be warranted for a period of one (1) year after start-up and Owner acceptance.

END OF SECTION 26 51 00



ADDRESSABLE FIRE ALARM (RENOVATION OF EXISITING)

## PART 1 - GENERAL

## 1.01 SUMMARY

- A. This Section covers fire alarm system's' initiating devices, notification appliances, controls, and supervisory devices.
- B. Work covered by this section includes the furnishing of labor, equipment, and materials for installation of the fire alarm system as indicated on the drawings and specifications.

## 1.02 ACCEPTABLE MANUFACTURERS

- A. Manufacturers: The equipment and service described in this specification are those supplied and supported by Johnson Controls Fire Protection, LP (Simplex).
- B. No Substitutions allowed; must match the Campus fire alarm network systems.

## 1.03 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this section.
- B. The work covered by this section is to be coordinated with related work as specified elsewhere in the specifications. Requirements of the following sections apply:
  - 1. Division 26: applicable sections apply
- C. The system and all associated operations shall be in accordance with the following Guidelines of the following Building Code: UBC IBC
  - 1. NFPA 72, National Fire Alarm Code
  - 2. NFPA 70, National Electrical Code
  - 3. NFPA 101, Life Safety Code
  - 4. NFPA 90A, Standard for the Installation of Air Conditioning and Ventilating Systems
  - 5. Other applicable NFPA standards
  - 6. Local Jurisdictional Adopted Codes and Standards
  - 7. ADA Accessibility Guidelines

## 1.04 SUBMITTALS

- A. General: Submit the following according to Conditions of Contract and Division 1 Specification Sections.
  - 1. Product data sheets for system components highlighted to indicate the specific products, features, or functions required to meet this specification. Alternate or as-equal products submitted under this contract must provide a detailed line-by-line comparison of how the submitted product meets, exceeds, or does not comply with this specification.
  - 2. Wiring diagrams from manufacturer.
  - 3. Shop drawings showing system details including location of FACP, all devices, circuiting and details of Tru-Site graphic screens.
  - 4. Product certification signed by the manufacturer of the fire alarm system components certifying that their products comply with indicated requirements.
  - 5. Record of field tests of system.

## 1.05 QUALITY ASSURANCE

- A. Installer Qualifications: A factory authorized installer is to perform the work of this section.
- B. Each and all items of the Fire Alarm System shall be listed as a product of a single fire alarm system manufacturer under the appropriate category by Underwriters Laboratories, Inc. (UL), and shall bear the "UL" label.
- C. Exception: Notification Appliance Devices by COOPER Notification (Wheelock) are

ADDRESSABLE FIRE ALARM (RENOVATION OF EXISITING)

acceptable

## PART 2 - PRODUCTS

## 2.01 ADDRESSABLE MANUAL PULL STATIONS

- A. Description: Addressable single- or double-action type, red LEXAN, with molded, raised-letter operating instructions of contrasting color. Station will mechanically latch upon operation and remain so until manually reset by opening with a key common with the control units.
- B. Protective Shield: Where required provide a tamperproof, clear LEXAN shield and red frame that easily fits over manual pull stations. When shield is lifted to gain access to the station, a battery powered piercing warning horn shall be activated. The horn shall be silenced by lowering and realigning the shield. The horn shall provide 85dB at 10 feet and shall be powered by a 9 VDC battery.

## 2.02 SMOKE SENSORS

- A. General: Comply with UL 268, "Smoke Detectors for Fire Protective Signaling Systems." Include the following features:
  1. Factory Nameplate: Serial number and type identification.
  2. Operating Voltage: 24 VDC, nominal.
  3. Self-Restoring: Detectors do not require resetting or readjustment after actuation to restore normal operation.
  4. Plug-In Arrangement: Sensor and associated electronic components are mounted in a module that connects to a fixed base with a twist-locking plug connection. Base shall provide break-off plastic tab that can be removed to engage the head/base locking mechanism. No special tools shall be required to remove head once it has been locked. Removal of the detector head shall interrupt the supervisory circuit of the fire alarm detection loop and cause a trouble signal at the control unit.
  5. Each sensor base shall contain an LED that will flash each time it is scanned by the Control Unit (once every 4 seconds). In alarm condition, the sensor base LED shall be on steady.
  6. Each sensor base shall contain a magnetically actuated test switch to provide for easy alarm testing at the sensor location.
  7. Each sensor shall be scanned by the Control Unit for its type identification to prevent inadvertent substitution of another sensor type. Upon detection of a "wrong device", the control unit shall operate with the installed device at the default alarm settings for that sensor; 2.5% obscuration for photoelectric sensor, 135-deg F and 15-deg F rate-of-rise for the heat sensor, but shall indicate a "Wrong Device" trouble condition.
  8. The sensor's electronics shall be immune from false alarms caused by EMI and RFI.
  9. Sensors include a communication transmitter and receiver in the mounting base having a unique identification and capability for status reporting to the FACP. Sensor address shall be located in base to eliminate false addressing when replacing sensors.
  10. Removal of the sensor head for cleaning shall not require the setting of addresses.
- B. Type: Smoke sensors shall be of the photoelectric or combination photoelectric / heat type.
- C. Bases: Relay output, sounder and isolator bases shall be supported alternatives to the standard base.
- D. Duct Smoke Sensor:
  1. Photoelectric type, with sampling tube of design and dimensions as recommended by the manufacturer for the specific duct size and installation conditions where applied. Sensor includes relay as required for fan shutdown.
  2. Environmental compensation, programmable sensitivity settings, status testing, and

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monitoring of sensor dirt accumulation for the duct sensor shall be provided by the FACP.

3. The Duct Housing shall provide a supervised relay driver circuit for driving up to 15 relays with a single "Form C" contact rated at 7A@ 28VDC or 10A@ 120VAC. This auxiliary relay output shall be fully programmable. Relay shall be mounted within 3 feet of HVAC control circuit.
4. Duct Housing shall provide a relay control trouble indicator Yellow LED.
5. Compact Duct Housing shall have a transparent cover to monitor for the presence of smoke. Cover shall secure to housing by means of four (4) captive fastening screws.
6. Duct Housing shall provide two (2) Test Ports for measuring airflow and for testing. These ports will allow aerosol injection in order to test the activation of the duct smoke sensor.
7. Duct Housing shall provide a magnetic test area and Red sensor status LED.
8. For maintenance purposes, it shall be possible to clean the duct housing sampling tubes by accessing them through the duct housing front cover.
9. Each duct sensor shall have a Remote Test Station with an alarm LED and test switch.

### 2.03 HEAT SENSORS

- A. Thermal Sensor: Combination fixed-temperature and rate-of-rise unit with plug-in base and alarm indication lamp; 135-deg F fixed-temperature setting except as indicated.
- B. Thermal sensor shall be of the epoxy encapsulated electronic design. It shall be thermistor-based, rate-compensated, self-restoring and shall not be affected by thermal lag.
- C. Sensor fixed temperature sensing shall be independent of rate-of-rise sensing and programmable to operate at 135-deg F or 155-deg F. Sensor rate-of-rise temperature detection shall be selectable at the FACP for either 15-deg F or 20-deg F per minute.
- D. Sensor shall have the capability to be programmed as a utility monitoring device to monitor for temperature extremes in the range from 32-deg F to 155-deg F.

### 2.04 ADDRESSABLE CIRCUIT INTERFACE MODULES

- A. Individual addressable modules (IAMs)
  1. Both power and communications from a two-wire MAPNET II or IDNet circuit. They provide location specific addressability to a single initiating device (such as single station smoke detector alarm contacts or heat detector contacts) or multiple devices at the same location by monitoring normally open dry contacts and the wiring to an end-of-line resistor.
    - a. Total wiring distance from IAM to supervision resistor(s) of up to 500 ft (152 m)
    - b. Monitored connection is compatible with Simplex® 2081-9044 Overvoltage Protectors for outdoor wiring or electrically noisy applications
    - c. For use in indoor locations up to 158° F (70° C) such as attic spaces or similar applications.
  2. Model 4090-9001 is packaged in a thermoplastic housing and provides screw terminal connections and a status indicating LED. (**ISU Standard choice**)
    - a. Enclosed design minimizes dust infiltration
    - b. Mounts in standard single gang electrical box
    - c. Screw terminals for wiring connections
    - d. Visible LED flashes to indicate communications
    - e. Optional covers are available to allow LED to be viewed after installation (requires mounting bracket, ordered separately)
  3. Model 4090-9051 is an encapsulated package with wire leads. It does not provide a status indicating LED.
  4. IDNet communications provides current limited monitoring:

ADDRESSABLE FIRE ALARM (RENOVATION OF EXISTING)

- a. Provides monitoring of tamper switch (supervisory) and waterflow switch (alarm) on same circuit using one point
  - b. Available with IDNet communications only
  - c. Multiple operation modes are available and are selectable at the control panel:
    - a. Contact closure status can be tracked
    - b. Momentary contact closure conditions can be selected at the panel to be latched or tracked.
- B. Individual Addressable Relay Module (Relay IAM)
- 1. IDNet Relay IAMs allow fire alarm control panels to control a remotely located Form "C" contact using IDNet addressable communications for both data and module power. Typical applications would be for switching local power for control functions such as elevator capture, or control of HVAC components, pressurization fans, dampers, etc. Relay status is also communicated requiring only one device address.
    - a. A single addressable point provides control and status tracking of a Form "C" contact
    - b. Contact Rating
      - 1) Power Limited 2A @ 24VDC resistive
      - 2) Power Limited 1A @ 24VDC inductive
      - 3) Non-power limited 0.5A @ 120VAC resistive
    - c. Low power latching relay design allows IDNet communications to supply both data and module power
    - d. Relay is set to OFF on initial power up and upon loss of IDNet communications
    - e. Enclosed design minimizes dust infiltration
    - f. Mounts in standard 4" (102 mm) square electrical box, optional adapter bracket is available to mount in a 4 11/16" (119 mm) square electrical box
    - g. Screw terminals for wiring connections
    - h. Visible LED flashes to indicate communications
    - i. Optional covers are available to allow LED to be viewed after installation
- C. Dual Contact Relay IAM (Individual Addressable Module)
- 1. Same as Addressable Relay Module (Relay IAM) , item B above, except with two form C contacts on common relay.

## 2.05 STANDARD ALARM NOTIFICATION APPLIANCES

- A. Alarm notification appliances by Simplex Grinnell and COOPER Notification (Wheelock) are acceptable. Match existing fire alarm device styles when possible.
- B. Visible/Only: Strobe shall be listed to UL 1971. The V/O shall consist of a xenon flash tube and associated lens/reflector system. The V/O enclosure shall mount directly to standard single gang, double gang or 4" square electrical box, without the use of special adapters or trim rings. V/O appliances shall be provided with different minimum flash intensities of 15cd, 75cd and 110cd. Provide a label inside the strobe lens to indicate the listed candela rating of the specific Visible/Only appliance.
- C. Speaker/Visible: Combination Speaker/Visible (S/V) units combine the speaker and visible functions into a common housing. The S/V shall be listed to UL 1971 and UL 1480.
  - 1. Twisted/shielded wire is required for speaker connections on a standard 25VRMS or 70.7VRMS NAC using and UTP conductors, having a minimum of 3 twists per foot is required for addressable strobe connections.
  - 2. The following taps are available: 0.25W, 0.50W, 1.0W and 2.0W. At the 1.0W tap, the speaker has minimum UL rated sound pressure level of 84dBA at 10 feet.
  - 3. The S/V shall have a frequency response of 400 to 4000 Hz for Fire Alarm and 125 to

ADDRESSABLE FIRE ALARM (RENOVATION OF EXISITING)

12kHz for General Signaling.

4. The S/V installs directly to a 4" square, 1 ½ in. deep electrical box with 1 1/2" extension for Simplex devices and a 4" square 1 ½ in. deep for Wheelock devices.
- D. Speaker: Speaker notification appliances shall be listed to UL 1480.
1. The speaker shall operate on a standard 25VRMS or 70.7VRMS NAC using twisted / shielded wire.
  2. The following taps are available: 0.25W, 0.50W, 1.0W and 2.0W. At the 1.0W tap, the speaker has minimum UL rated sound pressure level of 84dBA at 10 feet.
  3. The S/V shall have a frequency response of 400 to 4000 Hz for Fire Alarm and 125 to 12kHz for General Signaling.
  4. The Speaker installs directly to a 4" square, 1 ½ in. deep electrical box with 1 1/2" extension for Simplex devices and a 4" square 1 ½ in. deep for Wheelock devices.
- E. Notification Appliance Circuit provides synchronization of strobes at a rate of 1Hz. The capability to synchronize multiple notification appliance circuits shall be provided.
- F. Accessories: The contractor shall furnish the necessary accessories.
- G. NAC Power Extender
1. The IDNet NAC Power Extender panel shall be a stand-alone panel capable of powering a minimum of 4 notification appliance circuits. Notification appliance circuits shall be [Class B Style Y][Class A Style Z] rated at 2 amps each. Panel shall provide capability to be expanded to 8 notification appliance circuits.
  2. The internal power supply & battery charger shall be capable of charging up 12.7 Ah batteries internally mounted or 18Ah batteries mounted in an external cabinet.
  3. The NAC extender panel may be mounted close to the host control panel or can be remotely located. The IDNET Addressable NAC Extender Panel when connected to an addressable panel shall connect to the host panel via an IDNet communications channel. Via the IDNET channel each output NAC can be individually controlled for general alarm or selective area notification.
  4. For IDNet connected NAC extender panels up to five panels can be connected on a single [Class A wired] IDNet channel.
  5. When connected to a conventional (non-addressable panel) one or two standard notification appliance circuits from the main control panel may be used to activate all the circuits on the NAC power extender panel.
  6. Alarms from the host fire panel shall signal the NAC power extender panel to activate. The panel shall monitor itself and each of its NACs for trouble conditions and shall report trouble conditions to the host panel.

## PART 3 - EXECUTION

## 3.01 INSTALLATION, GENERAL

- A. Install system components and all associated devices in accordance with applicable NFPA Standards and manufacturer's recommendations.
- B. Installation personnel shall be supervised by persons who are qualified and experienced in the installation, inspection, and testing of fire alarm systems. Examples of qualified personnel shall include, but not be limited to, the following:
  1. Factory trained and certified personnel.
  2. National Institute of Certification in Engineering Technologies (NICET) fire alarm level II certified personnel.
  3. Personnel licensed or certified by state or local authority.

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## 3.02 WIRING INSTALLATION

- A. System Wiring: Wire and cable shall be a type listed for its intended use by an approval agency acceptable to the Authority Having Jurisdiction (AH) and shall be installed in accordance with the appropriate articles from the current approved edition of NFPA 70: National Electric Code (NEC).
- B. Contractor shall obtain from the Fire Alarm System Manufacturer written instruction regarding the appropriate wire/cable to be used for this installation. No deviation from the written instruction shall be made by the Contractor without the prior written approval of the Fire Alarm System Manufacturer.
- C. Paint fire alarm system junction boxes covers red.

## 3.03 FIELD QUALITY CONTROL

- A. Manufacturer's Field Services: Provide services of a factory-authorized service representative to supervise the field assembly and connection of components and the pre-testing, testing, and adjustment of the system.
- B. Service personnel shall be qualified and experienced in the inspection, testing, and maintenance of fire alarm systems. Examples of qualified personnel shall be permitted to include, but shall not be limited to, individuals with the following qualifications:
  - 1. Factory trained and certified.
  - 2. National Institute for Certification in Engineering Technologies (NICET) fire alarm certified.
  - 3. International Municipal Signal Association (IMSA) fire alarm certified.
  - 4. Certified by a state or local authority.
  - 5. Trained and qualified personnel employed by an organization listed by a national testing laboratory for the servicing of fire alarm systems.
- C. Pre-testing: Determine, through pre-testing, the conformance of the system to the requirements of the Drawings and Specifications. Correct deficiencies observed in pre-testing. Replace malfunctioning or damaged items with new and retest until satisfactory performance and conditions are achieved.
- D. Final Test Notice: Provide a 10-day minimum notice in writing when the system is ready for final acceptance testing.
- E. Minimum System Tests: Test the system according to the procedures outlined in NFPA 72.
- F. Retesting: Correct deficiencies indicated by tests and completely retest work affected by such deficiencies. Verify by the system test that the total system meets the Specifications and complies with applicable standards.
- G. Report of Tests and Inspections: Provide a written record of inspections, tests, and detailed test results in the form of a test log.
- H. Final Test, Certificate of Completion, and Certificate of Occupancy:
- I. Test the system as required by the Authority Having Jurisdiction in order to obtain a certificate of occupancy.

## 3.04 CLEANING AND ADJUSTING

- A. Cleaning: Remove paint splatters and other spots, dirt, and debris. Clean unit internally using methods and materials recommended by manufacturer.
- B. Occupancy Adjustments: When requested within one year of date of Substantial Completion, provide on-site assistance in adjusting sound levels and adjusting controls and sensitivities to suit actual occupied conditions. Provide up to three visits to the site for this purpose.

## 3.05 SPECIAL INSTALLATION INSTRUCTIONS

- A. Existing devices shall be protected during the construction phase for re-use. Contractor to

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- protect all existing fire alarm devices during entire renovation project to prevent dust and debris infiltration. Devices not protected shall be cleaned by the fire alarm system manufacturer's service representative. Any devices damaged beyond repair / cleaning will be replaced with new at no cost to the Owner. Plastic bagging of devices is acceptable.
- B. Coordinate with the Owner for disabling fire alarm devices during construction. Turn over any fire alarm devices not slated for re-use to the Owner.
  - C. Include in the Bid all costs associated with reprogramming of the existing fire alarm system and Owner's Tru-Site fire alarm network for this Project.
  - D. Wiring to devices above suspended ceilings may be exposed plenum rated cable. Wiring to exposed surface mounted devices or wiring concealed in walls to devices shall be in metal raceway.
  - E. New devices shall match existing devices being re-used. If devices are not available to match existing all new devices of that type shall be provided.

END OF SECTION 28 31 12

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