

Facility Services Subgroup

Preface for Divisions 21` through 28

1.1 EXECUTIVE SUMMARY

- A. This document provides standards for the Consultants and Contractors producing mechanical and electrical design documents for construction projects at Creighton University. Consultants shall follow these standards as amended for each project and any special instructions provided for development of any specific project.
- B. All questions regarding this document should be directed to Creighton Facilities Management. The requestor shall provide written requests for deviation from these standards and the results of such requests. Documentation is the responsibility of the requestor and will not be provided by Creighton Facilities Management.

1.2 GENERAL DESIGN REQUIREMENTS

- A. The selection, design, and specification of the materials and workmanship to be incorporated into the mechanical and electrical systems of the project should respond to the environment of a major educational institution. It should provide reliable, durable, low maintenance, energy efficient, and long life usage while recognizing the budget constraints for the project.
- B. Contract documents shall require the Contractor to obtain all permits, licenses, inspections, and arrangements required to accomplish the work. This shall be at the Contractor's expense.
- C. All utilities shall be installed in accordance with local rules and regulations, and all charges by the utility company for temporary or permanent power shall be paid by the Contractor.
- D. Architect/Engineer shall review requirements for shop drawings, product data, or samples with the Owner. Required submittal information shall be submitted to the Architect/Engineer and simultaneously submitted to the Owner for coincident review. Any shop drawings larger than 11 inches x 17 inches shall be required to be submitted on a reproducible with one (1) blue line or photocopy print for review.
- E. Contract documents shall make it plain that review of submittals shall not relieve Contractor from the responsibility for any deviation from requirements of the contract.
- F. Contract documents shall require two (2) copies of Operation and Maintenance (O&M) Manuals be required for the equipment furnished. Manuals shall be submitted to the Architect/Engineer for review and

distribution to the Owner not less than thirty (30) days prior to substantial completion of the project.

- G. Contract documents shall require each Contractor to seal all penetrations through partitions as part of their work and utilize fire-rated sealant in the rated structures. Installation of sealant shall be in accordance with UL Listing.
- H. Existing roadways, curbs, and walks shall be protected from damage to as great an extent as possible. Any damage by the Contractor shall be repaired to the original condition.
- I. Contract documents shall specify requirements for work in existing buildings. These requirements shall be coordinated with the Owner for the specific project.
- J. Contract documents shall require a minimum of four (4) hours of training be provided for each specification division. Training shall include, but is not limited to, the following:
 - 1. Startup and shutdown procedures
 - 2. Periodic maintenance
 - 3. Safety
 - 4. Seasonal changeover
 - 5. Emergency operation
- K. At the completion of training, the Contractor shall turn over to the Owner all required keys and special tools for installed equipment. Each key or tool shall be labeled with its use. Contractor shall deliver to Facilities Management any broken cases of material clearly marked with project identification.
- L. Architect/Engineer shall provide electronic files of all drawings to the Owner following the completion of the project in .DWG format compatible with AutoCAD 2004.
- M. Construction documents should be on sheets no larger than 30 inches x 42 inches.
- N. The building systems should be designed to be eligible for the Energy Star label. Application requirements include:
 - 1. A Building Professional (currently only Professional Engineers) has verified on the Statement of Energy Performance (stamped/embossed and signed) that each of the Indoor Air Quality requirements has been met. This Professional Engineer must be licensed or have reciprocity rights to practice in the state in which the building is located.

2. The building has at least 10 energy consumption data entries for meter covering a period of 365 days +/- 45 days.
 3. The Statement of Energy Performance must be stamped and signed, the Letter of Agreement must be signed, and the complete application package must be postmarked to EPA within 105 days of the most recent end date for energy consumption data entered in the Portfolio Manager.
- O. The Architect/Engineer shall incorporate construction changes into a set of reproducible record drawings in .dwg format compatible with AutoCAD 2004.
- P. The contract documents shall indicate to the Contractor that drawing files are available in electronic media format for their use in preparing shop drawings. The charge for this service shall be listed in the documents.
- Q. The contract documents shall provide for coordination of connection of all equipment whether it be provided by other divisions of the specifications or by the Owner.
1. Complete drawings after to submitting product data on items included in coordination drawings.
 2. The list below is the precedence of assigned work items for space priority in descending order. Items not listed shall have the same precedence as similar items.
 - a. Reflected ceiling with all light fixtures, access above light fixtures required for maintenance, sprinkler head locations, and all ceiling fixtures and devices.
 - b. Space designed for future utility placement.
 - c. Gravity flow plumbing waste, roof drainage, steam condensate return, gravity flow central wet vacuum, and other systems that rely upon gravity for flow.
 - d. Ductwork and appurtenances, except that external bracing shall be relocated to accommodate local interference.
 - e. Fire sprinkler piping.
 - f. Pneumatic tube systems.
 - g. Bus duct.
 - h. Cable tray with access identification 18 inches horizontal to 6 inches above tray.
 - i. Wet vacuum system piping that is not gravity.
 - j. Electrical conduit over 2 inches in diameter.
 - k. HVAC piping except for gravity flow steam condensate and pressurized domestic water piping.
 - l. Medical gas piping and carbon dioxide piping, refrigerant safety relief piping.
 - m. Plumbing vents.

R. Operation and Maintenance Manuals:

1. The Contractor shall prepare two Operation and Maintenance Manuals for the equipment furnished. Manuals shall be submitted to the Architect/Engineer for review and distribution to the Owner not less than 30 days prior to substantial completion of the project. Manuals not meeting the following requirements may be rejected by the Architect/Engineer.
2. Each manual shall be assembled in a three-ring binder with hard cover and plastic finish. Binders shall not exceed 3-inch thickness. Where more than one binder is required, the manuals shall be separated into a logical grouping, i.e., "Mechanical", "Electrical", "Maintenance", "Operation", "Parts", "Shop Drawings", etc. Each binder shall have the following information clearly printed on its front cover and binding as indicated below:
 - a. Project name and address (cover and binding).
 - b. Portion of the work covered by each volume (if more than one volume in the set). Where more than one volume is required, label each volume as "Volume ___ of ___" (cover and binding).
 - c. Name, address, and telephone number of Contractor and all Sub-Contractors including night or emergency number (cover).
3. Manual shall include, but shall not be limited to, the following:
 - a. A Complete Index. Contractor may submit the index to the Architect/Engineer for review prior to submittal of complete manuals if desired.
 - b. Names, Addresses, and Telephone Numbers. This list shall include the manufacturer and local representative who stocks or furnishes repair parts for all items of equipment and shall be typed on a single page in front of the binder.
 - c. Start-Up, Operation, and Shutdown Procedures. Provide a written description of procedures for start-up, operation, and shutdown of each mechanical/electrical item or system. This description shall include motors to start, valves to open, switches to operate, buttons to push, etc., in proper sequence, and location of switches and pushbuttons. Description shall include item references or labels used in the contract documents unless otherwise instructed in advance by the Owner.
 - d. Seasonal Changeover Procedure: Provide a written description of the procedure for necessary seasonable changeover from heating to cooling and vice versa.
 - e. Equipment Accessory Schedule. Upon completion of the work, the Contractor shall furnish the Owner with a complete equipment accessory schedule listing each piece

- of equipment and the related size, type, number required, and the manufacturer of all renewable items.
- f. Lubrication Schedule: Provide a chart listing each piece of equipment, the proper type of oil or grease required, and recommended frequency of lubrication.
 - g. Manufacturer's Operation and Maintenance Manuals and Parts Lists.
 - h. Emergency Procedures. Provide a written description of emergency operating procedures or a list of service organizations (including addresses and telephone numbers) capable of rendering emergency services to the various parts of the system.
 - i. One copy of all shop drawings and product data, clearly marked for each item furnished using the designation label specified or indicated on drawings.
 - j. All manufacturers' warranty information.
 - k. Normal Maintenance Schedule. Include a listing of work to be performed at various time intervals; i.e., 30, 90, 180 days and yearly.
 - l. Motor List: The list shall indicate motor location, equipment served (using labels indicated on drawings), horsepower, electrical characteristics, motor type, and RPM. Motors less than 1/2 horsepower need not be included.

S. Record Documents:

- 1. Mark up a clean set of drawings, as the work progresses, to show the dimensioned location and routing of all electrical work which will become permanently concealed. Show routing and location of items cast in concrete or buried underground. Show routing of work in permanently concealed blind spaces within the building. Show complete routing and sizing of any significant revisions to the systems shown. Indicate termination location of all spare conduits.
- 2. Maintain "record document" drawings in an up-to-date fashion in conjunction with the actual progress of installation. This set of field drawings shall be kept up on a daily basis; failure to do so will be grounds for forfeiture of final payment. Accurate progress mark-ups shall be available on-site for examination by the Owner, Architect, or Engineer at all times. Indicate items other than that indicated on the drawings and all items added by change order.
- 3. Submit original drawings to Architect/Engineer to incorporate into electronic AutoCAD .DWG format.