FS-6. A REVIEW OF ENERGY CONSERVATION REQUIREMENTS (Cont'd)

MEDICAL CENTER EXCEPTIONS TO DIVISION FS – FACILITIES SERVICES

PART FOUR DOCUMENTS FOR PLUMBING, FIRE PROTECTION, HVAC, AND ELECTRICAL CONSTRUCTION

FACILITY SERVICES - REQUIREMENTS FOR PLUMBING, FIRE PROTECTION, HVAC, AND ELECTRIC DOCUMENTS

2007 Edition, Published April, 2007

FS-1. SEPARATE DOCUMENTS REQUIRED

.2 SEPARATION OF PLUMBING; AND HEATING, VENTILATING AND AIR CONDITIONING: The University requires that the complete separation of documents for these Divisions of The Work be made evident by prohibiting use of the word "MECHANICAL" when writing specifications for these Divisions and when making references to the contracts and contractors for any of these parts of The Work. In preparation of specifications, numbering of sections for Plumbing shall be preceded by "22"; and Heating, Ventilating and Air Conditioning by "23". Any system of numbering (either an alphanumerical system or a decimal system) may be used for the sections, articles, and paragraphs comprising these Divisions, at the Associate's option.

On drawings avoid using "mechanical" to describe pipe or duct chases, HVAC or electric equipment rooms, etc.

FS-2. DESIGN CONSIDERATIONS

.1 DIRECT DIGITAL CONTROL (DDC) SYSTEM: To achieve precise control of all HVAC systems and to provide the means to integrate standard control functions with energy saving strategies, it is intended that all newly constructed and remodeled buildings on the Columbus campus be controlled using stand alone microprocessor based Direct Digital Control (DDC) computer systems. All hardware, software, and miscellaneous equipment required to insure that the DDC system can be managed from within the building and from a remote control center shall be provided as a part of the project. Control Centers now in existence or planned for the future are:

OSU Medical Center:
University Hospitals, James Cancer Hospital, University Hospital East, Medical Center Outreach Facilities

Each Associate shall submit schemes for connecting new DDC equipment. All DDC systems shall be connected to the control center(s) using the Medical Center’s fiber optic network, a hard-wired communication trunk, or a telephone communications trunk, as dictated by the capabilities of the system selected and by the location of the building being controlled.

All newly constructed and remodeled buildings/projects are to be controlled using BACnet compliant Direct Digital Controls. All controls shall tie in to the existing Delta Controls building automation front end. See MC Appendix A for requirements.

.1.1 OSUMC will require one BACnet Broadcast Management Device for every floor of every building. The OSUMC network will be segmented so that each floor will be a separate subnet from all others.

.1.2 Provisions for BACnet compliant DDC Systems for OSUMC are described thoroughly in MC Appendix A.

FS-6. A REVIEW OF ENERGY CONSERVATION REQUIREMENTS (Cont'd)

.1.3 OSUMC Building Automation Systems shall be based on Delta Controls. OSUMC Facilities shall be consulted for other manufacturers to be specified.

.4 METERING: Separate and permanent meters for all utilities (gas, electric, water, chilled water, and steam) shall be provided for each building. Some buildings and systems will require additional sub-metering to facilitate adjustment of charges for water supply and sewage discharged. Also see Sewer Auxiliary Metering Systems in Appendix. See Index for other references.

4.4 Sub metering requirements shall be coordinated with OSUMC Facilities Operations.

FS-3. COORDINATION OF CONTRACT DOCUMENTS

.5 USE OF PREMISES: Make reference to the applicable portions of Division 1. If routing of trucks hauling materials to and from the site cannot be adequately described in the specifications, show routes on the Location Plan.

5.3 Construction barriers and OSUMC construction requirements (i.e. interim life safety measures, special pressurization requirements, etc) shall be shown on plans also.

.17 PAINTING: Cleaning and painting of Plumbing, HVAC, Fire Protection, and Electrical items and equipment exposed to view should be specified in Division 9. If concealed installations require painting before being concealed, list the installations and specify that materials and application be as specified in Division 9. Do not specify painting of the same surface under more than one Division except shop prime coats, where protection is needed, color banding and flow arrows. See 09 91 23.1.

USE OF INK MARKING PENS ON ANY SURFACE IS PROHIBITED. Marks bleed through paint or other finishes.

.17.1 COLOR CODING OF PIPING: Specify that, after piping has been finish painted, the installer of the piping identify the type of service lines with applied color bands and stenciled letters and indicate direction of flow with stenciled arrows. Color bands shall be 1-inch wide, finished in gloss enamel; lettering and arrows shall be same color as the bands. Specify that indicators be applied at connections to pumps, chillers, and other equipment; at entrances to spaces; adjacent to valves; near access doors to pipe spaces; and at 20-foot maximum intervals on long pipe runs. Additionally, indicators shall be on both sides of partitions penetrated by piping, at least once in every space. Specify that letters be positioned to be easily read from a normal standing position.

.17.1.1 Use the following band colors and letter designations:

Type of Service	Color	Designation
PLUMBING PIPING (Show direction of flow and include pressure rating where applicable)		
Compressed Air	White	CA
Drain	Room Color	
Natural Gas	Yellow	Gas
Hydrogen	Red	HYD
Nitrogen	Black	NIT
Oxygen	Green	OXY
Vacuum	Room Color	VAC
Domestic Cold Water	Light Blue	DCWS
Domestic Hot Water	Dark Blue	DHWS
Domestic Hot Water Return	Dark Blue	DHWR
Deionized Water	Room Color	DZDW
Distilled Water	Room Color	DSTLW
Soft Water	Medium Blue	SFTW
Oil, Fuel, or Hydraulic	Orange	Oil
Medical Air	Yellow /Black	Med Air
Medical Vacuum	White/Black	Med Vac
Nitrous Oxide	Blue/White	Nitrous Oxide
Carbon Dioxide	Gray/Black	Carbon Dioxide
Instrument Air		Instrument Air
Laboratory Air		Lab Air
Laboratory Vacuum		Lab Vac
Reverse Osmosis Water		RO
HEATING AND COOLING PIPING (Show direction of flow and pressure rating)		
High Pressure Steam 125PSI	Aluminum/Orange Band	HPS
Med. Pressure Steam 50PSI	Aluminum	MPS
Low Pressure Steam 15PSI	Aluminum	LPS
Boiler Feed Water	Green	BLR F
Chilled Water Supply	Black	CWS
Chilled Water Return	Black	CWR
Condensate Water	Aluminum	COND
Condenser Water	Purple	CDSR
Hot Water Heating Supply	Lime Green	HWHS
Hot Water Heating Return	Lime Green	HWHR
Pumped Condensate Water	Black	PCD
FIRE PROTECTION PIPING		
Fire Line	Red	FL

FS-4. SUBMITTALS

.4 WARRANTIES, OPERATION AND MAINTENANCE MANUALS: At the time of Beneficial Occupancy of the project, four approved copies of warranties, instruction sheets, catalogue data, and final shop drawings secured in binders shall be forwarded to the University Architect's Office. Also see 01 78 23. Provide full information (trim sheets and log sheets) defining all conditions, quantities of refrigerant, pressures, temperatures, number of belts, belt sizes, etc. during the testing operations of each piece of equipment.

FS-5. SAFETY REQUIREMENTS

.2 Contractor shall be required to comply with all requirements for Material Safety Data Sheets (MSDS's), lockout and tagout procedures, confined space entry requirements, hot work permits, construction site fire protection, fall protection for all contractor and subcontractor employees, hazardous materials abatement procedures, prohibition of mercury-containing materials, etc. Contractors working within Medical Center facilities shall be required to comply with the Medical Centers' interim life safety measures.

FS-6. A REVIEW OF ENERGY CONSERVATION REQUIREMENTS

The subject of energy conservation is discussed in various sections of these BUILDING DESIGN STANDARDS. This review is made for the purpose of consolidating all requirements for this important part of design under one heading for easy reference.

.1 GENERAL REQUIREMENTS

.1.2 In the design of the HVAC and Electrical systems, consideration must be given to building utilization by planning for conservation of energy during summer and winter vacations and for other periods of minimum occupancy. Research laboratories, spaces for animals, and other spaces which might require 24 hours/day operation must be serviced by systems separate from office systems which may require only 8 hours/day operation, and classrooms which may be shut down during summer and vacation periods. In general, all space within the Medical Center operates 24 hours/day, 365 days/year.

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FS-6. A REVIEW OF ENERGY CONSERVATION REQUIREMENTS (Cont'd)

.3 SYSTEM DESIGN REQUIREMENTS

.3.2 Design temperatures for heating and air conditioning systems shall be as follows:

Summer: (Space conditioning)
Outside conditions, 92 degrees FDB and 74 degrees FWB

Inside conditions shall conform to the latest edition of the AIA Guidelines for Design and Construction of Health Care Facilities and as coordinated with OSUMC Facilities Operations. For those spaces not listed in these Guidelines, the inside conditions shall be 70-72 degrees FDB, 30-50% RH.

Winter: (Space Conditioning)
Outside conditions, +1 degrees FDB

Inside conditions shall conform to the latest edition of the AIA Guidelines for Design and Construction of Health Care Facilities and as coordinated with OSUMC Facilities Operations. For those spaces not listed in these Guidelines, the inside conditions shall be 70-72 degrees FDB, 30-50% RH.

Winter for preheat coil sizing on 100% outdoor air fan systems:
Outside conditions, (minus) -22 degrees FDB
Coil Leaving Air conditions, +55 degrees FDB

MC Relative humidity should conform to the latest edition of the AIA Guidelines for Design and Construction of Health Care Facilities.

FS-7. EQUIPMENT

.2 RELOCATING EXISTING EQUIPMENT

.2.1 Relocation of existing equipment must include disconnecting and moving to new location as well as restoration and capping utilities at the old location. Utilities, and utility support systems not intended for future use will be removed back to the source.

END OF FACILITY SERVICES