FHCRC/SCCA Facility Design Manual

Number	Div	Title	Buildings	Comment	Documents
		ARCHITECTURAL			
810	02	Landscaping	All	Rain Water Sensor: Include rain water sensor feature to reduce unnecessary water use.	Specification
000	04	Masonry	All	Chases: All chases shall be accessible for maintenance. Provide an access panel for personnel entry.	Drawing
335	08	Coiling Doors	All	Coiling Fire Doors: Provide motors for coiling fire doors.	
345	12	Laboratory Casework Systems	All	Fume Hoods: Delete fire extinguishers from fume hoods.	Specification
210	14	Traction Elevators	All	Controls System Integration: Provide features and accessories to facilitate remote monitoring of elevators at Thyssen-Sound Central Monitoring System in the Fairview Building Engineering Office LF-102.	Drawing and specification
		MECHANICAL			
000	15	General Mechanical Requirements	All	Submittals: Exceptions to contract documents must be so Noted and included in the first page of the material or equipment submittal. Failing this, the owner or Engineer reserve the right to enforce document requirements at no additional cost to the owner at any point in the project.	Specification and submittal
000	15	General Mechanical Requirements	All	Asbuilts: Asbuilt submittal shall include one full and two half size prints and two CD copies in both .DWG and PDF formats.	Specification
000	15	General Mechanical Requirements	All	Balancing Resolution Log: Mechanical contractor shall maintain a log of all issues raised by the balancer. The log shall be in a spreadsheet format to include: issue description, date identified, responsibility and date corrected. This log shall be distributed to the owner and Engineer and updated weekly.	Specification
000	15	General Mechanical Requirements	All	Training: Consult with Facilities Engineering for training requirements for users and operating engineers.	Specification
005	15	Motors	All	Motor Bearings: Three phase motors 50 HP and less shall have permanently lubricated and sealed motor bearings. The only exceptions to this are at chiller and elevator motors. Motors larger than 50 HP shall have regreasible bearings.	Specification and submittal

010	15	Variable Frequency Drives	All	Maunfacturers: Allowable manufacturers are Dan Foss Graham and ABB.	Specification and submittal
010	15	Variable Frequency Drives	All	Bypass Feature: Include a bypass feature with a manual reset.	Specification and submittal
010	15	Variable Frequency Drives	All	Controls System Integration: Specify vendor specific features or accessories that will allow drive to function according to Siemens specification section- "Sequence of Operation".	Specification
030	15	Mechanical Systems Insulation	All	Piping Inside Air Handling Units: Chilled and heating water piping inside AHU's not insulated from the factory shall be insulated by the mechanical contractor. Heating water piping insulation shall be glass fiber and chilled water piping insulation shall be closed cell elastomeric.	Specification
075	15	Mechanical Systems Identification	All	Piping Systems: Identification of piping and ductwork systems shall match contract drawing designations for new building construction and existing system designations for remodels.	Shop drawings
075	15	Mechanical Systems Identification	All	Terminal Box: Terminal box shall be named to correspond with the room location for the thermostat.	Drawing
084	15	Mechanical Systems Firestopping	All	Firestopping Color: Firestopping shall be RED in color.	Specification
100	15	Sanitary Waste and Storm Drainage Systems	All	Storm and Sanitary Sumps: Storm and sanitary pumps shall be submersible type and mounted on a rail system that will facilitate removal without requiring a confined space permit.	Drawing and specification
100	15	Sanitary Waste and Storm Drainage Systems	All	Storm and Sanitary Pumps: Indicate lifting eye in structure above to facilitate removal of sump pumps.	Drawing
140	15	Corrosion Resistant Waste and Vent System	A,B,C,D,M	Piping Joints: All drain piping must be socket welded except last joint to sink may be mechanical. Vent piping may be either socket welded or mechanical.	Specification
150	15	Gas Piping	All	Earthquake Valves: Provide a 3-valve bypass for automatic earthquake valves for testing and maintenance.	Drawing
160	15	Material Specialties	All	Pressure Reducing Valves: For "non-flowing" systems such as chilled and process cooling water, PRV's shall be pilot operated type and rated for "dead end service". PRV's for flowing systems such as domestic and lab hot and cold water can be internal pilot operated.	Specification
170	15	Heat Tracing	All	Thermostat Control: Add ambient sensing for control of all heat tracing used for freeze protection.	Specification
190	15	Plumbing Fixtures	A,B,C,D,M	Faucet aerators in restrooms shall be low flow type rated at 0.5 GPM max.	Specification

190	15	Plumbing Fixtures	SCCA	Faucet spouts in patient rooms shall be "laminar flow" type.	Specification
260	15	High Purity Water System Equipment	All	Tempering Valve: Provide tempered hot and cold water inlet for this system.	Drawing
280	15	Automatic Fire Sprinkler Systems	All	Only welded and threaded pipe connections are allowable. Saddle type branch connections are not acceptable.	Specification
280	15	Automatic Fire Sprinkler Systems	All	Flexible hose assemblies are acceptable at final connection to sprinkler heads. Hose assemblies shall be all stainless steel braided hose and UL rated.	Specification
280	15	Automatic Fire Sprinkler Systems	All	Dry pipe systems shall use schedule 40 piping.	Specification
340	14	Laboratory Vacuum Piping System	All	Vacuum Exhaust Trap: Provide a trap at the vacuum exhaust outlet to prevent condensate from the exhaust piping from reentering the pumps when off.	Drawing
360	15	Laboratory Compressed Air System	All	Air Dryer: Include heated air drying feature and moisture sensing controls for dessicant air dryers to minimize wasted compressed air during regeneration process.	Drawing and specification
510	15	Pipe and Pipe Fittings	All	Hydronic System Drain and Fill: Provide means for quickly draining and filling all hydronic systems with valved connection at low points.	Drawing and specification
510	15	Pipe and Pipe Fittings	All	Reheat Coil Piping: Add bypass tee or other provision aheadof reheat coil piping to allow coil to be bypassed for flushing procedure. Accessories also to be bypassed are wye strainer, circuit setter and control valve.	Drawing and specification
510	15	Pipe and Pipe Fittings	All	Demolition: All unused piping shall be removed back to the main header and capped. Hangars shall also be removed.	Drawing
510	15	Pipe and Pipe Fittings	All	Tempering Valves: Add check valves to both cold and hot water inlets to water tempering valves.	Drawing and specification
510	15	Pipe and Pipe Fittings	All	Section Cuts: Complex areas such as boiler and chiller rooms and penthouses shall have a minimum of two section cuts to facilitate piping plans for these spaces.	Drawing
510	15	Pipe and Pipe Fittings	All	Saddle connections to piping: Saddle connections shall be soldered, welded or threaded. Saddles employing a gasketed clamp are not acceptable.	Specifications
510	15	Pipe and Pipe Fittings	All	Chilled Piping Inside AHU's: Chilled water piping inside air handlers shall be copper due continuos presence of moisture.	Drawing and specification
520	15	Valves	All	Full Port Ball Valves: All ball valves shall be fully ported.	Specification
520	15	Valves	All	Branch Valves: Provide branch valves at every floor for hydronic, potable and non potable water systems.	Drawing and specification

530	15	Piping Specialties	All	Automatic Air Vents: Provide at all piping drops in recirculating systems. Pipe vents to drain.	Specification
530	15	Piping Specialties	All	EMCS Sensor Locations: Provide pressure and temperature gauges at all EMCS temperature and pressure sensor locations in piping and ducts. Coordinate locations with controls contractor.	Specification
530	15	Piping Specialties	All	Compression Tank Access: Provide clearance overhead at compression tanks of 150% of tank height to facilitate removal of internal bladder.	Drawing and specification
530	15	Piping Specialties	All	Pressure Gauges: Provide a pressure gauge at both sides of all basket strainers, water filters, gas regulating valves and water pressure regulating valves.	Drawing and specification
530	15	Piping Specialties	All	Circuit setters shall be as manufactured by Tour & Anderson.	Specifications
530	15	Piping Specialties	All	Tempering Valves: Add a temperature gauge to the outlet side of all water tempering valves.	Drawing and specification
530	15	Piping Specialties	All	Pipe Expansion Joints: Eliminate expansion joints where possible and use expansion elbows or "U-bends". When expansion joints are necessary, show all pipe guides and anchors as recommended by the Expansion Joint Manufacturer's Association (EJMA).	Drawing
530	15	Piping Specialties	All	Circuit Setters and Flow Measurement Devices: Devices shall be sized as recommended by the manufacturer for intended flow. Line size devices may not always be correct.	Drawing and specification
530	15	Piping Specialties	All	Strainers: Provide 100 mesh screen in all strainers ahead of solenoid valves and fuel oil pumps.	Specification
530	15	Piping Specialties	All	Devices at Pumps: Valves, check valve, balancing valve and flexible connectors shall be full line size before reducing to pump connection size.	Specification
530	15	Piping Specialties	All	Chemical Pot Feeders: All heating, chilled and process cooling water systems shall be provided with chemical pot feeders.	Drawing and specification
530	15	Piping Specialties	All	Polishing Filters: Add polishing filters to heating and reheat systems and to cooling side of process cooling water systems.	Drawing
600	15	Primary Heating Equipment	All	Blend Pump: Include a blend pump as an accessory for all Scotch Marine boilers	Drawing and specification
600	15	Primary Heating Equipment	All	Boiler Minimum Temperature: Provide sensors and controls to initiate lag boiler operation whenever boiler temperature falls below 150 degrees F.	Specification
600	15	Primary Heating Equipment	All	Oil Fired Boilers: Oil fired boilers shall be provided with supply and return side oil meters.	Specification

610	15	Primary Cooling Equipment	All	Controls Integration: Specify options or accessories for vendor specific control panel that will interface with Siemensspecification section -"Sequence of Operation".	Specification
610	15	Primary Cooling Equipment	All	Evaporative Cooling Towers: Add VSD's to evaporative cooling towers for maintenance and energy considerations.	Drawing
620	15	Coils	All	Coil Velocity: Velocity at heating and cooling coils shall not exceed 300 FPM.	Specification and drawing
630	15	Pumps	All	Impeller Size Selection: For VAV pump systems, impellers selected shall be suitable for each of three operating conditions: Future maximum design flow (GPM), operating flow and 50% of operating flow. Submittals shall include actual pump curves for each condition.	Specification, drawing & submittals
670	15	Chemical Treatment Systems	All	Glycol Systems: Where freeze protection is required for hydronic systems, only propylene glycol shall be used. The only exception to this is at emergency generator cooling where jacket water comes in contact with antifreeze. In this case, ethylene glycol shall be used.	Specification and drawing
700	15	Packaged Air Handling Units	All	Controls Integration: Specify options or accessories for vendor specific control panel that will interface with Siemens specification section -"Sequence of Operation".	Specification
720	15	Self Contained Air Conditioning Units	All	Controls Integration: Specify options or accessories for vendor specific control panel that will interface with Siemens specification section -"Sequence of Operation".	Specification
720		Self Contained Air Conditioning Units	All	Computer Room Air Conditioning Unit (CRAC) Graphical Display: The display panel and controller shall have both cumulative and 24 hour graphical trending capability of individual components including each compressor, fan, humidifier, reheat, alarms and "free cooling".	Specification and drawing
730	15	Factory-Fabricated Custom Air Handling Units	All	Fan and Motor Access: Assure that doors are large enough to remove motor and fan wheel.	Specification and drawing
730	15	Factory-Fabricated Custom Air Handling Units	All	Fan and Motor Access: Provide I-beam overhead above fan motor to facilitate removal. Beam shall start above center of motor and shall extend to the center of access door. Provide I-beam for motors 25 HP and above.	Specification and drawing
730	15	Factory-Fabricated Custom Air Handling Units	All	Serviceable Belt Guards: Refer to drawing detail for belt guard requirements.	Specification

730		Factory-Fabricated Custom Air Handling Units	All	Features: Special construction features shall include: double sloped drain pans, motor removal rail to cabinet door, sliding racks for prefilters, all filters upstream loaded, extended grease lines where applicable, access doors open such that pressure effects seal, access doors sized for removal of largest internal component, receptacles located inside motor sections, cooling coil drain pan extending 2 feet downstream of cooling coil, magnehelic pressure gauge at each filter section, gaskets or boots at all factory and field cabinet penetrations (caulking not acceptable)	Drawing and specification
740	15	Humidification Equipment	All	Dispersion: Humidifiers for vivarium spaces shall be configured for complete absorption within a distance of 18 inches downstream of humidifier dispersion tubes. Dispersion tubes shall be vertical.	Drawings
740	15	Humidification Equipment	All	Humidifier Steam Pressure: Do not exceed 20 PSIG steam supply pressure for humidifiers.	Drawings
800	15	Fans	All	Wheel Size Selection: For VAV fan systems, wheels selected shall be suitable for each of three operating conditions: Future maximum design CFM, operating CFM and 50% of operating CFM. Submittals shall include actual fan curves for each condition.	Specification, drawing & submittals
800	15	Fans	All	Wheel Selection: Whenever a fan wheel class selection is near the upper range of its maximum allowable RPM, increase the fan selection class (i.e. Select Class III over Class II). Wheels selected shall have the capability of increasing future RPM by 30%.	Specification and drawing
800	15	Fans	All	Extended grease lines for bearings: Provide extended grease lines for all fan bearings where not accessible without removing a protective cage. Do not provide extended grease lines where fan bearings are accessible.	Specification
800	15	Fans	All	Adjustable Sheaves: Adjustable sheaves are not allowed for any fans or fan motors. Use only fixed sheaves.	Specification
800	15	Fans	All	Booster Fan: Where devices such as a vented biosafety cabinet in a fume exhaust system drives manifolded exhaust fan static pressure, add a booster fan for that device.	Drawing
830	15	Air Terminal Devices	All	A single air terminal device shall serve no more than four spaces. These spaces shall be similar in use and exposure.	Drawing
830	15	Air Terminal Devices	All	Union at Reheat Coils: Provide one union at coil connection to reheat coils. Install union to facilitate removal of reheat coil control valve.	Drawing
850	15	Ductwork	All	Duct Sizing: Round up not down when sizing ducts.	Drawing

850	15	Ductwork	All	Duct Demolition: Unused ductwork shall be removed back to the main trunk and capped. Hangars shall be removed also.	Drawing
860	15	Ductwork Specialties	All	Fire/Smoke Damper: Include accessory device for remote monitiring of damper position for both "open" and "closed" positions.	Specification
860	15	Ductwork Specialties	All	Remote Controlled Damper Operator: Use only direct coupled shaft or right angle gear drive operators for remote controlled dampers. Cable operated devices are not acceptable.	Specification
902	15	Control Valves and Dampers	All	Terminal Box Actuators: Allowable manufacturer for terminal box actuators is: "Belimo", except where fast acting actuator is required for fume hood exhaust terminal.	Specification
903	15	Controls Instrumentation	All	Pressure Sensors: Label static pressure sensors and their controlled device including the corresponding fan or pump.	Specification
903	15	Controls Instrumentation	All	UPS: Add UPS power to all EMCS floor level controllers including MBC's, MEC's, etc.	Specification
903	15	Controls Instrumentation	All	Thread-o-lets: Coordinate locations with piping contractor for all required pressure and temperature sensors. Provide two thread-o-lets in each location: one for sensor and one for a temperature or pressure gauge for calibration purposes. Strap on type sensors are not acceptable.	Specification
910	15	Control Sequences	All	Lab Air Change Rate Setback: Provisions shall be included to reduce air change rates and temperatures in labs to 3 air changes when unoccupied.	Drawing and specification
910	15	Control Sequences	All	Fire/Smoke Dampers: Provide EMCS connection and programming to remotely indicate fire/smoke damper positions both open and closed.	Specification
930	15	Lab Data Acquisition Systems (LDAS)	All	Ultra Low Freezers: Alarms for ultra low freezers shall not be combined. Each freezer will be alarmed individually.	Specification
		ELECTRICAL			
000	16	General Electrical Requirements	All	Training: Consult with facilities Engineering for training requirements for operating engineers.	Specification
000	16	General Electrical Requirements	All	Flush Mounted Electrical Panels: Flush mounted electrical panels shall have at least (3) 3/4-inch empty conduits to accessible space.	Specification

025	16	Power Distribution Acceptance Tests	All	Completion Schedule: Electrical contractor shall submit a schedule for acceptance testing. Testing shall be complete 30 days prior to occupancy. Where specifications call for independent testing, electrical contractor testing shall not be considered an acceptable substitute.	Specification
025	16	Power Distribution Acceptance Tests	All	Motors: Motors 25 HP and larger shall be tested. Submit test results to Engineer and Owner.	Specification
075	16	Electrical Identification	All	Dedicated Receptacles: Dedicated receptacles shall be identified as "dedicated" on the faceplate.	Specification
120	16	Conductors	All	Ground Wires: Grounds for isolated ground equipment shall be green with a yellow stripe.	Specification
250	16	Automatic Transfer Switch	All	Bypass Isolation Switch: Include accessory bypass isolation switch for "standby" power".	Specification
250	16	Automatic Transfer Switch	All	Manufacturer: Include only ASCO as the allowable manufacturer or negotiate other manufacturer's out of project later to maintain campus standard (ie training/maint.)	Specification
250	16	Automatic Transfer Switch	All	A "transfer presignal to the elevator" feature shall be added to the ATS serving the elevators. Provide a wiring connection from the ATS to the elevator machine room. Commission prior to occupancy.	Drawing and specification
425	16	Switchboards	All	Infrared Testing: Infrared testing of switchboards shall be performed after building is substantially occupied.	Specification
425	16	Switchboards	All	Adjustable Trip Settings: The electrical engineer shall provide calculated trip settings for adjustable trip breakers.	Drawing
440	16	Disconnect Switches	All	Allowable Manufacturer: Square D only. Hinged covers are required.	Specification
440	16	Disconnect Switches	All	Add local disconnect switch for all fire/smoke dampers.	Drawing and Specification
470	16	Panelboards	All exc. G	Spare Spaces: Provide a minimum of 25% spare space in all panelboards. Spares shall include 3 adjacent spare spaces for future addition of a TVSS device.	Drawing and specification
470	16	Panelboards	All	Allowable Manufacturer: Square D only. Hinged covers are required.	Specification
475	16	Distribution Panelboards	All	Allowable Manufacturer: Square D only	Specification
510	16	Lighting Fixtures	G	Patient Bathroom Lighting: Provide some minimum level of standby lighting for patient bathrooms.	Drawing

510	16	Lighting Fixtures	All	Standby Power for Lighting and Receptacles: Ensure that there are lights and receptacles on standby power for critical locations such as mechanical and electrical rooms, generator room, control room and penthouses. Assure garage gates and doors have standby power.	Drawing
510	16	Lighting Fixtures	All	Exit Lights: All exit lights shall be green L.E.D.	Specification
510	16	Lighting Fixtures	All	Battery backup Lighting: Provide battery backup lighting for generator room and main switchboard room.	Drawing
510	16	Lighting Fixtures	All	Spare Ballasts: Provide one spare ballast where 10 or more fixtures are used.	Specification
594	16	Lighting Control Devices	A,B & C	Ultrasonic Occupancy Sensors: Do not use ultrasonic type occupancy sensors within 100 feet of holding rooms due to adverse effect upon animals.	Drawing
620	16	Standby Electrical Systems	All	Remote Anunciator Panel: Provide a remote generator anunciator panel in the EMCS Control Room CD-141. Panel shall indicate when generator operates and shall indicate individual alarms same as at generator panel.	Drawing and specification
620	16	Standby Electrical Systems	All	Standby System: Engine generator set shall be based upon standby ratings and not continuous ratings.	Specification
620	16	Standby Electrical Systems	All	Battery Charger Alarm: Generator battery charger shall be alarmed at the EMCS.	Specification
620	16	Standby Electrical Systems	All	Spare Lugs: Include a spare set of lugs at the genset for both load bank testing and portable generator deployment.	Specification
620	16	Standby Electrical Systems	All	Load Bank Testing: Include performance testing of the generator utilizing a load bank test that records voltage and amps over time with both the addition and removal 25, 50, 75 and 100% loads. Engineer to review and approve results.	Specification
620	16	Standby Electrical Systems	All	Commissioning: ATS and generator system commissioning shall be completed 30 days prior to occupancy.	Specification
620	16	Standby Electrical Systems	All	Battery Charger Disconnect: Provide a lockable disconnect for the battery charger input.	Specification.
722	16	Multiplexed Fire Alarm Detection System	All	Submittal and Asbuilt Drawings: Contractor's drawings shall include a "Sequence of Operations" matrix.	Specification
722	16	Multiplexed Fire Alarm Detection System	All	Duct Smoke Detectors: Use dispersion type duct detectors in ducts with sealed housing.	Specification
722	16	Multiplexed Fire Alarm Detection System	All	Boiler Operation Alarms: Provide alarm function for automatic boiler operation including individual alarms for low water cutoff, high temperature alarm and flame failure.	Specification