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ROME, GA 30161

RYAN DAVIS, FACILITIES DIRECTOR

SARA HIGHTOWER
LIBRARY CHILLER
REPLACEMENT



7/16/14

General Notes

GENERAL SCOPE OF WORK — CHILLER UPGRADE

1. DEMO EXISTING CHILLER AND REMOVE FROM PREMISES.
2. INSTALL NEW CHILLER (CH-1) PER SPECIFICATIONS. EXISTING CHILLED WATER PUMP REMAINS.
3. CONNECT NEW CHILLER TO EXISTING ELECTRICAL, WATER, AND DDC CONTROL SYSTEMS.
4. CHILLER TO BE PROVIDED WITH EQUIPMENT REQUIRED TO OPERATE ON EXISTING DDC CHILLER CONTROL SEQUENCE.
5. MODIFY EXISTING CHILLER SUPPORT FRAME ON ROOF TO FIT NEW CHILLER FOOTPRINT. EXISTING VIBRATION ISOLATORS TO BE RE-USED.

NOTICE

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ISSUED FOR OWNER REVIEW	6/25/14
ISSUED FOR BIDDING	7/16/14

DRAWING TITLE
THIRD FLOOR EQUIPMENT ROOM AND MECH. YARD PLAN

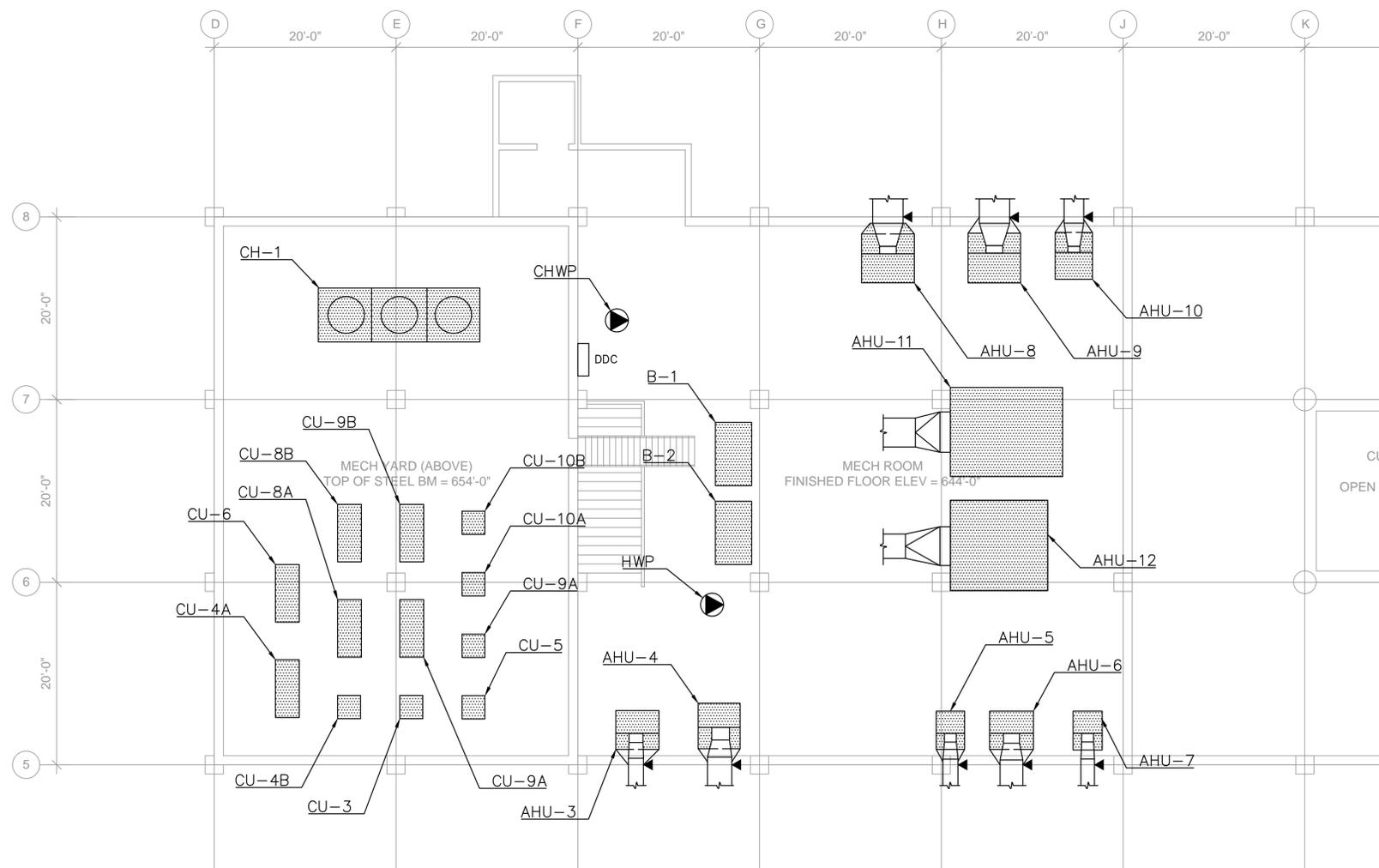
PROJECT NO. 705-1402	SCALE AS SHOWN
APPROVED JD	CHECKED JD
DRAWN JD	DATE 6/25/14

M-1

AIR COOLED CHILLER SCHEDULE											
TAG	NOMINAL TONS	DESIGN GPM	MINIMUM GPM	EWT/LWT (DEG. F)	WATER ΔP (FT WG)	CONNECTIONS (IN.)		EER	WEIGHT (LBS.)	BASIS OF DESIGN	NOTES
						CHWS	CHWR				
CH-1	110	254	—	54/44	13.0	3	3	9.8	7,060	DAIKIN AGZ110D	1,2,3

NOTES:

1. BASIS OF DESIGN IS DAIKIN-MCQUAY. EQUIVALENT MODELS BY TRANE, CARRIER ARE ACCEPTABLE.
2. LOUVERED CONDENSER HAIL GUARDS.
3. COMPRESSOR SOUND BLANKETS.



1 THIRD FLOOR EQUIPMENT ROOM AND MECH. YARD PLAN
M-1 SCALE: 1/8" = 1'-0"

SECTION 15010 – MECHANICAL GENERAL

PART 1 GENERAL

- 1.1 GENERAL REQUIREMENTS
- A. Specification: This specification is intended to cover all portions of this building.
 - B. Reference Codes: This installation shall comply with the following codes and regulations, along with all Georgia amendments.
 1. Current Georgia State Minimum Standard Mechanical Code.
 2. Current NFPA No. 90A Installation of Air Conditioning and Ventilation Systems.
 3. Current Georgia State Minimum standard Plumbing Code.
 4. Current Georgia State Minimum Standard Gas Code.
 5. Current NFPA #54 National Fuel Gas Code.
 6. Current Georgia State Minimum Standard Gas Code.
 7. Current NFPA No.70, National Electric Code.
 8. Current Georgia State Minimum Life Safety Code.
 9. Current Georgia State Minimum Standard Fire Prevention Code.
 10. Current Georgia State Energy Code for Buildings
 - C. Reference Standards: This installation shall comply with the following standards.
 1. Manufacturers Standardization Society of the Valve and fittings industry (1815 North Ft. Meyer Drive, Arlington, VA 22209), MSS–SP–58–2002, called MSS–SP–58.
 2. MSS–SP–69–2003, called MSS–SP–69.
 3. American Society of Heating and Ventilating and Air Conditioning Engineers Guide, Fundamentals, 2009 Edition.
 4. Sheet Metal and Air Conditioning Contractor National Association (SMACNA) HVAC Duct Construction Standards, Metal & Flexible, 2005 Edition. Fire, Smoke and Radiation Damper Installation Guide for HVAC Systems, 1986 Edition. Seismic Restraint Manual Guidelines for Mechanical Systems, Second Edition.
 5. American Society of Sanitary Engineers (ASSE) Standard, Latest Edition.
 6. North American Insulation Manufacturers Association (NAIMA) Fibrous Glass Duct Construction Standards.
- 1.2 REGULATIONS
- A. Attention is called to the fact that all work shall be done in accordance with all applicable City, County and State regulations, which regulations shall be considered as minimum requirements, and shall not alter the arrangement and pipe sizes indicated on the plans, except where they conflict.
 - B. Contractor is responsible for obtaining all permits and paying all fees required to complete the Work
- 1.3 DRAWINGS
- A. The work is shown on the project drawings and specifications.
- 1.4 PROTECTION OF PUBLIC
- A. If the contractor must operate any potentially dangerous devices before all specified safety valves controls and devices are installed, he shall notify the Architect in writing. He shall not operate such devices under these conditions until arrangements for supervision by competent operators have been instituted and Architect's written approval has been issued.
- 1.5 EXCAVATION, SHORING AND BRACING
- A. Excavate and back–fill for the installation of all underground work.
 - B. Provide all shoring and bracing to prevent cave–ins during the construction period.
- 1.6 SHOP DRAWINGS
- A. Shop drawings shall be submitted for but not limited to the following items:
 1. All Scheduled Equipment
 2. Ductwork & Accessories
 3. Hangers
 4. Piping & Accessories
 5. Supports
 6. Vibration Isolation
 7. Fixtures
 8. Roof Portals
 9. Control System
 10. Duct Systems
 11. Equipment Curbs
 12. Insulation
 13. Filters
 14. Access Panels
 15. Louvers
 16. Refrigerant Pipe Sizes
 - B. Provide with the submittal package the proposed Test & Balance Company's credentials as described in Section 15950. Include a letter from the Test & Balance company indicating that they have read Section 15950 and will perform testing and balancing of the mechanical systems as described in that Section.
 - C. Provide a complete list of all accessories and options (Indicate factory or field installed) for all scheduled mechanical equipment, including air distribution devices. Provide manufacturer generated specifications and ratings sheets for each individual piece of air conditioning and heating equipment. Generic photocopies from manufacturers catalog will not be accepted.
 - D. In addition to cut sheets, provide a summary sheet indicating exactly what pipe material joining methods, valves, etc. will be provided in the various piping systems.
 - E. The Contractor shall produce ¼" scale CAD–generated ductwork and piping shop drawing for every area of the building. Contractor shall coordinate all new mechanical systems with other Divisions, specifically including piping, lights, the building structure, and ceiling heights. It shall be the Contractor's responsibility to ensure that the mechanical work is coordinated with all other trades. The shop drawings submitted shall reflect this coordination in its entirety, including location of piping 2" and larger, all ductwork (except runouts to diffusers), and all equipment by dimensions to column lines. Bottom of duct and bottom of pipe dimensions shall be taken from finished floor, and shall be recorded on the shop drawings for review. Any interferences or conflicts not resolved during normal shop drawing coordination between trades shall be specifically noted to the Architect for his instructions. Conflicts arising out of work installed (or ductwork already fabricated) without shop drawings or shop drawings that have no been completely coordinated, shall be the Contractor's responsibility and at his expense for any necessary changes.
 - F. The Contract Drawings are diagrammatic and indicated generally the size and location of ductwork and equipment. While duct sizes shall not be decreased, it is recognized that job site conditions may require re–routing or re–sizing of ductwork, and the Contractor shall be responsible for this coordination. Ductwork that has to be re–sized and/or re–routed as a result of this coordination effort shall be the Contractor's responsibility and at his expense. Ductwork re–sized shall be equivalent to that shown on the drawings.
 - G. Steel fabrication shop drawings shall be coordinated with all Division 15 equipment and roof openings. The resulting coordination shall be confirmed and verification shall be submitted with associated equipment and roof curbs.
 - H. Division 15 shall coordinate with structural steel contractors to insure where ductwork is required to be routed within joist space that an alternate to x bracing is installed. Failure to coordinate shall subject the Contractor to full cost incurred to meet the design intact on the contract documents.
- 1.7 MOTORS, WIRING AND ELECTRICAL EQUIPMENT
- A. All motors required for this work shall be built in accordance with the latest standards of National Electrical Manufacturer's Association, and shall be especially designed for quiet operation. All motors shall be selected for operation within their nameplate amperage. Adjustable bases shall be provided with motors and equipment which have belt drives.
 - B. All electrical materials shall comply with requirements of the National Electric Code. All contactors, starters, relays and panels used in this work, which are included in Underwriters Label Service, shall be new and bear the National Board of Fire Underwriters inspection label. Material not included in Underwriters Label service shall be new and conform to NEMA or other applicable industry standard.
 - C. Division 16, ELECTRICAL, provides for the furnishing of conduit and wire from electrical source to electrical use, called "path of power," and for the installation of certain line voltage devices specified in Division 15 which lie in the "path of power," including but not

- limited to:
1. Manual switches.
 2. Line voltage thermostats.
 3. Solid state speed controllers.
 4. Operators for operable dampers.
 5. Aquastats for domestic hot water circulating pumps.
 6. Alarms for Flow Switches and Valve Supervisor Switches.
- D. The "path of power" terminates at contactors or control panels of the following listed items of equipment. These control panels contain starters/contactors for the motors or heaters installed on or within the unit and are specifies in Division 15. Any wiring past the point of termination described above is Division 15 work.
1. Packaged Rooftop Units.
 2. Domestic Water Heaters.
 3. Make–up Air Units.
 4. Condensing and/or Heat Pump Units.
 5. Fan Coil Units.
 6. Ductless Split Systems.
 7. Electric Heaters.
- E. Division 16, ELECTRICAL, provides for electrical power to any given item of equipment at the voltage and phase required by the primary use only. If the item of equipment contains devices such as fans, thermostats, motorized dampers or other controls which require other than primary voltage for their proper function, then transformers shall be furnished under Division 15 for that purpose.
- F. Voltage and phase for Division 15 equipment shall be as specified by Division 16. Division 15 Contractor shall submit a list of all mechanical equipment requiring electrical connections to the Contractor prior to release of any equipment, for coordination with the Division 16 contractor. A copy of this list that has been reviewed and approved by the General Contractor shall be submitted to the Architect with the submittal for mechanical equipment. Failure to include this list may result in the rejection of the entire mechanical equipment submittal.
- G. The control power source (point of connection for control power) for major equipment except those single phase fans which are thermostatically controlled and those items listed in C above, are provided at the combination starters.
- H. The automatic control of signal for STOP–START of major equipment is furnished and installed to and from combination starts as part of Division 15.
- I. All other conduit and wire, not in "path of power" described above is included in Division 15.
- J. If any Division's Contractor makes a change by submittal, by delivery, by wiring rearrangement or power requirements, which results in increased costs, the Contractor initiating the change shall bear all cost increases.
- K. All motors that are 1 HP and larger shall be high efficiency motors with nominal and minimum full load efficiencies equal to or greater than those specified by the State Energy Code. Specifications shall be submitted for each motor furnished.
- L. Starters or contactors shall be furnished in Division 15 for each motor.
 1. Magnetic starters shall be NEMA standard sizes adequate for the load served, Size 00, 1, 2, 3, 4. Half sizes and/or quarter sizes are not acceptable.
 2. Overload relays shall be unit constructed, hand reset melting alloy type, and shall be provided for all ungrounded legs.
 3. Units shall have NEMA–1 enclosures, three thermal overloads in three–phase starts, HAND–OFF–AUTO switches as required by the "controls" specification section.
 4. All fractional HP single–phase motors shall have internal thermal overload protection except where starters are scheduled.
 5. All motor starters shall be of the same manufacturer and shall be General Electric Type CR–306, or equal by Square–D, Westinghouse, Allen–Bradley, Furnas, Siemens, or Cutler–Hammer subject to full compliance with all criteria.
- M. Where power wiring to Division 15 equipment is not within the equipment curb, roof curb and boots shall be provided under Division 16. The portal location shall be coordinated with Division 15 equipment power inlet requirements, and located not to block access for equipment servicing.
- 1.8 ACCESS PANELS
- A. Shall be provided to permit operation of concealed valves, dampers, or equipment. The following table lists types of Bilco access frames and doors. Panels of equivalent construction by Titus, Milcor, Hohmann, and Barnard or Zurn are acceptable.

B. Wall:	
1. Sheetrock	Style G
2. Plaster	Style A
3. Masonry	Style C
C. Ceiling:	
1. Sheetrock	Style G
2. Plaster	Style A
3. Concealed spline	Style D
4. Lay–in tile	None
D. Fire Rated Wall or Ceiling	Style F (U.L. Listed)
E. Sizes shall be: Small valves – 12" x 12"; Multiple valves and dampers – 24" x 24"	
F. Access panels shall be insulated for sound barrier equal to wall in which it is installed.	
G. Acoustical Tile: Coordinate with tile installed to provide a removal tile at access point. Install a colored thumb tack to mark the access panel of above ceiling equipment, control instrument, valves or relay.	
- 1.9 WARRANTY
- A. The Contractor shall operate the air conditioning, heating and ventilating systems and plumbing systems for a period of one week to the satisfaction of the Architect. Thereafter, the Contractor shall guarantee and be responsible for all materials and workmanship (parts and labor) for a period of one (1) year following the date of acceptance by the Architect.
 - B. The Contractor shall also provide maintenance for the one (1) year period by providing four (4) periodic inspections at approximately three–month intervals, which shall include the following.
 1. Check all bearing, align and oil or grease.
 2. Check belt tensions and pulley adjustment and adjust as necessary.
 3. Check filters and advise Owner when change is necessary.
 4. Check refrigerant charges and oil levels and replenish as necessary.
 5. Check and re–calibrate controls as necessary.
 - C. Any required maintenance for the above shall be performed and materials needed shall be furnished by the Contractor. Not included in the materials to be furnished by the Contractor are fuel, electricity, water and filters. Provide the Owner with four (4) copies of the inspection reports indicating all items checked and adjustment or repairs performed.
 - D. Water heaters shall be guaranteed for five years; parts and labor.
 - E. All equipment compressors shall be guaranteed for five years; parts and labor.
- 1.10 CUTTING AND PATCHING
- A. The Contractor shall set sleeves for pipes, ducts and equipment accurately before the concrete walls and floors are poured.
 - B. Should the contractor neglect to perform this preliminary work and should cutting and patching be required in order to install the piping, ductwork or equipment, then the expense of the cutting and restoring of surfaces to their original condition shall be borne by the Contractor.
- 1.11 BASIS OF DESIGN
- A. When brand, trade or manufacturer's names are used for basis of design, they are used in the interest of brevity to describe the style, type, size, quality or arrangement of articles of equipment and are not intended to limit competition. If articles of equipment by manufacturers other than basis of design are submitted for installation, the Architect shall compare them with specified articles of equipment on basis of qualities mentioned. The size, weight and arrangement of other equipment shall be checked by the Contractor to ascertain that it can be installed, connected, operated, and serviced successfully, and that walking space and service space can be maintained without altering equipment space or enclosures or the work of other trades. Manufacturers not listed as "Acceptable

- Manufacturers" will not be considered.
- B. If any Division's Contractor makes a change by submittal, by delivery or by wiring rearrangement which results in increased costs, the Contractor initiating the change shall bear all cost increases.
- 1.12 AS–BUILT DRAWINGS
- A. Per the Georgia State energy Code, the Contractor shall produce and submit to the Architect, "As–Built" drawings, four (4) copies, as described below.
 - B. As work progresses, neatly and clearly record on four (4) sets of mechanical plans (in red) all changes and deviations from the contract drawings in size, locations, etc., of all piping, ductwork terminal units and other equipment. Record (in red) final location of piping, ductwork, starts, valves, thermostats, etc., by dimensions to adjacent walls and floors. Make sufficient measurement to accurately locate all equipment. Locate underground lines by dimension from building walls.
- 1.13 OPERATION AND MAINTENANCE MANUALS
- A. Operation and Maintenance manuals (6 sets) shall be provided to the Owner or the Owners designated representative. Manuals shall be in accordance with the Georgia State Energy Code for Buildings.
 1. Manuals shall include as a minimum the following:
 - a. Final, corrected submittal data with equipment sizes and selected options for each piece of equipment, including Engineer's submittal review comments.
 - b. Current manufacturer's published operation and maintenance manuals for each piece of equipment.
 - c. Name, address and phone number of at least one LOCAL service agency.
 - d. HVAC controls system maintenance and calibration information including wiring diagrams, schematics, and control drawings.
 - e. Complete narrative of how each system is intended to operate, including suggested set–points.
 - f. Copy of the final Test & Balance report.
 - g. Copy of the final As–built drawings.
 - h. Controls certification letter.
 - i. Copy of Engineer's final punch list items, with each item checked off when completed or an explanation of why the item was not completed.
- 1.14 INTERFACES WITH OTHER WORK
- A. There are many interfaces between the work involved with Division 15 and the work involved with other Sections and Divisions, particularly with Division 16. Contractor shall be aware of the requirements of these other Sections or Divisions and his responsibilities at the interfaces.
 - B. No mechanical equipment, piping, or ductwork shall be places within 42" of switchboards and/or panel boards.
 - C. No water piping (domestic, storm, sanitary, etc., except sprinkler piping when required) shall be located above electrical switchboards and/or panel boards. When sprinklers are required, shields must be provided over the panels.
- 1.15 EQUIPMENT IDENTIFICATION
- A. Equipment Identification:
 1. All mechanical equipment shall be labeled with Bakelite nameplates with 2" high white letters on a black background, securely affixed to equipment for outdoor or indoor service.
 2. Equipment identification numbers shall be the same as those scheduled on the design drawings. Identification shall be located where it can be conveniently read, and shall be located in the same relative position on like equipment.
 3. In addition to the above ID tags, all scheduled equipment shall be provided with permanent factory installed engraved nameplate labels listing complete model and serial numbers, unit voltage, motor sizes, etc.
 4. Identify all disconnect switches that are not directly attached to the equipment that they serve, with identical ID tags as specified above for the equipment.
- 1.16 PIPE IDENTIFICATION
- A. All piping systems shall be identified.
 1. All piping systems within the building except as noted herein shall be identified with clear block letters and number stenciled on the outside surface of the pipe or insulation, indicating the system contents by abbreviated letters and direction of the flow.
 2. This identification marking shall be applied to the pipe systems where pipe enters or leaves a wall or floor, and item of equipment such as pumps, fan coil units and tanks, and at tees. Identification shall be applied no less than 50 feet apart on horizontal pipe, and one identification per floor on vertical pipe.
 3. Letters and numbers shall be high on pipe 2" and smaller.
 4. Letters and numbers shall be 1" high on pipe 3" and larger.
 5. Directional arrows shall be 4" long and wide.
 6. Letters and numbers shall be black on white pipe or insulation.
 7. Letters and number shall be white on dark pipe or insulation.
 8. Pipe identification symbols shall be the same as shown on the drawings.
 9. Soil, vent and refrigerant piping shall not be identified.
- 1.17 PERMITS AND INSPECTIONS
- A. The Contractor shall secure and pay for all permits, fees, inspections, and utility connection costs.
 - B. BOILER TEST CERTIFICATES: It shall be the Contractor's responsibility to have each boiler, large (greater than 120 gallon capacity) water heater, and pressure vessel inspected by a State of Georgia certified inspector upon installation. Each inspection report shall be submitted to the Georgia Department of Labor, Safety Engineering Section, 1700 Century Circle, Atlanta, Georgia 30345 to the attention of Direction of Engineering, PLUS a copy of each report transmitted to the Architect. ONE additional copy of each report shall be included in EACH of the FOUR Close–Out Manuals.
- 1.18 EQUIPMENT & MATERIAL PROTECTION
- A. All equipment and material shall be kept clean and free of debris as construction progresses. Closures shall be provided over duct, piping and major equipment openings during storage, erection and prior to connection. Material finishes shall be protected by covers to prevent impingement of corrosive, abrasive and disfiguring foreign matter. Accidental finish damage shall be repaired equivalent to original finish.
- 1.19 TEST, BALANCE AND REPORT
- A. See Section 15950.
- 1.20 PROHIBITED MATERIALS
- A. All products, materials or assemblies which contain asbestos or polychlorinated biphenyl (PCB) in any form or in any concentration whatsoever, are expressly forbidden from being used on this project.
- 1.21 SITE VISIT AND FAMILIARIZATION
- A. Contractors proposing to undertake work under this Division shall visit the site of the work and fully inform themselves of all conditions that effect the work or cost thereof, examine the drawings and specifications as related to the site conditions, and acquaint themselves with the utility companies from whom services will be supplied; verify locations of utility services and determine requirements for connections.
 - B. Consideration will not be granted for any alleged misunderstanding of the amount of work to be performed. Tender of proposal shall convey full agreement to all items and conditions specified, indicated on the drawings, and/or required by nature of the site.
 - C. Attention is called to the fact that this scope of work includes renovation to an existed facility and/or an addition to an existing building. When the work is finished, the mechanical systems shall be complete in every respect, and completely integrated with all affected mechanical and control systems.
 - D. Existing mechanical systems in the existing facility shall not be interrupted without prior approval of the Owner or Architect.
- 1.22 DISINFECTION AND TESTING OF WATER SYSTEM
- A. Sanitize plumbing potable water systems after cleaning and pressure tests, with chlorinated potable water solution to 200 ppm chlorine residual after 24–hours minimum, then flushed with fresh potable water until effluent chlorine content does not exceed make–up. Water samples shall be sent to Local Health Department (LHD) for testing. A letter of approval must be obtained from the LHD before the system is put into service.
 - B. All domestic water piping shall be disinfected with chlorine before it is placed into

operation. The chlorinating material shall be liquid chlorine conforming to Federal Specification BB–C–120 and shall be introduced to the system by experienced operators only. The chlorine solution applied to the piping sections or system shall contain at least fifty (50) parts per million of available chlorine and shall remain in the sections or system for a period of not less than sixteen (16) hours. During the disinfection period all valves shall be opened and closed at least four (4) times. After the disinfection period, the chlorinated water shall be flushed from the system with clear water until the residual chlorine content is not greater than two–tenths parts per million (0.2PPM). Submit certification to the Architect and Owner that the system was disinfected.

END OF SECTION

- GENERAL NOTES:
1. ALL MECHANICAL EQUIPMENT AND INSTALLATIONS SHALL CONFORM WITH THE REQUIREMENTS OF THE LOCAL CODE OFFICE'S LATEST APPROVED VERSION OF THE INTERNATIONAL MECHANICAL CODE, THE INTERNATIONAL BLDG. CODE, THE STATE ENERGY CODE, NFPA 90A, 101, UNDERWRITERS LABORATORIES AND ALL APPLICABLE LOCAL CODES AND ORDINANCES.
 2. PRIOR TO PURCHASING ANY MATERIALS OR STARTING ANY WORK, CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS, DUCTWORK, ELECTRICAL BREAKER AND WRING, AND PIPE SIZES, EQUIPMENT LOCATIONS, ETC. AFFECTING THIS WORK AND SHALL REPORT ANY DEVIATIONS TO THE ARCHITECT.
 3. SUBMITTALS AND SHOP DRAWINGS SHALL BE SUBMITTED TO AND APPROVED BY THE ARCHITECT AND MECHANICAL ENGINEER PRIOR TO ORDERING, PURCHASING, OR FABRICATING ANY MECHANICAL EQUIPMENT. THESE SHALL INCLUDE ALL EQUIPMENT SPECIFIED ON THE PLANS OR IN THE PROJECT SPECIFICATIONS.
 4. ALL MECHANICAL EQUIPMENT REQUIRING ELECTRICAL POWER SHALL BE INSTALLED WITH DISCONNECT SWITCHES AT EACH PIECE OF EQUIPMENT. COORDINATE SWITCH TYPE (FUSED OR NON–FUSED) WITH EQUIPMENT CHARACTERISTICS, MANUFACTURER'S RECOMMENDATIONS, AND ELECTRICAL PLANS AND SPECIFICATIONS. SEE SPECIFICATIONS FOR DESCRIPTION OF INTERFACE WITH DIVISION 16 WORK.
 5. ALL REQUIRED CONTROL WIRING SHALL BE INCLUDED AS PART OF THE MECHANICAL WORK. WIRING IN HVAC PLENUM SPACES SHALL BE INSTALLED ACCORDING TO CODE REQUIREMENTS.
 6. ALL MECHANICAL EQUIPMENT SHALL BE INSTALLED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.
 7. ALL MECHANICAL EQUIPMENT SHALL BE LABELED WITH BAKELITE NAMEPLATE WITH 2" HIGH WHITE LETTERS ON A BLACK BACKGROUND. NAMEPLATE SHALL SHOW EQUIPMENT TAG USED ON THESE DRAWINGS. ELECTRICAL DISCONNECTS FOR EQUIPMENT SHALL BE LABELED TO MATCH EQUIPMENT SERVED.
 8. ALL PIPING, ELECTRICAL CONDUIT, AND DUCTWORK SHALL BE SUPPORTED BY THE BUILDING STRUCTURE AND SHALL NOT HANG FROM OR REST ON CEILING TILES OR CEILING STRUCTURE.
 9. BRANCH RUN–OUT DUCTS SHALL BE SAME SIZE AS DIFFUSER NECK IF NOT NOTED OTHERWISE.
 10. EQUIPMENT LOCATIONS SHOWN ARE DIAGRAMMATIC. COORDINATE AND ROUTE EQUIPMENT TO MEET JOB REQUIREMENTS. LOCATION OF EQUIPMENT MUST BE COORDINATED WITH ALL DISCIPLINES BEFORE FINAL LOCATIONS ARE SELECTED. WEIGHTS OF EQUIPMENT MUST BE VERIFIED AND COORDINATED WITH STRUCTURAL SYSTEMS MANAGERS BEFORE EQUIPMENT CAN BE MOVED INTO LOCATION OR INSTALLED.
 11. ALL CONDENSATE DRAIN LINES FROM HVAC EQUIPMENT SHALL BE TRAPPED AND SHALL DRAIN INTO BUILDING FLOOR DRAINS, ROOF DRAINS, OR STORM DRAINS. CONDENSATE SHALL BE INSULATED SCHEDULE 40 PVC (EXCEPT INSULATED COPPER IN HVAC PLENUMS). CONDENSATE SHALL BE PUMPED AS REQUIRED.
 12. ALL PIPING ABOVE GRADE SHALL BE SUPPORTED BY THE BUILDING STRUCTURE, AND SHALL NOT REST ON CEILING TILES OR CEILING STRUCTURE. PIPE HUNG FROM JOISTS SHALL BE HUNG FROM THE TOP CHORD OF JOISTS.
 13. ALL PIPE AND DUCT PENETRATIONS OF FIRE AND/OR SMOKE RATED ASSEMBLIES SHALL BE FIRESTOPPED AS REQUIRED TO RESTORE ASSEMBLY TO ORIGINAL INTEGRITY. FIRE BARRIER PRODUCTS SHALL BE MANUFACTURED BY 3M COMPANY, CP25 CAULK, CP195 COMPOSITE PANEL, FS195 WRAP/STRIP, OR PSS 7900 SERIES SYSTEMS AS RECOMMENDED BY MFG. FOR PARTICULAR APPLICATIONS, OR EQUIVALENT SYSTEM AS APPROVED BY LOCAL CODE OFFICIALS.
 14. PROVIDE AND INSTALL THE EQUIPMENT REQUIRED FOR INTERFACE WITH THE EXISTING HONEYWELL DDC SYSTEM. CONTRACTOR IS RESPONSIBLE FOR A FULLY FUNCTIONING CHILLER OPERATING ON EXISTING CHILLER CONTROL SEQUENCES AT THE COMPLETION OF THE JOB.
 15. CONTRACTOR SHALL COORDINATE THE INSTALLATION OF ALL MECHANICAL EQUIPMENT, DUCTWORK, ETC. TO FIT WITHIN THE SPACE ALLOWED BY ARCHITECTURAL AND STRUCTURAL CONDITIONS. CUTTING OR OTHERWISE ALTERING ANY STRUCTURAL MEMBERS SHALL NOT BE PERMITTED WITHOUT WRITTEN PERMISSION FROM THE ARCHITECT.



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7/16/14

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DRAWING TITLE

GENERAL NOTES AND SPECIFICATIONS

PROJECT NO.	705–1402	SCALE	AS SHOWN
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M-4

OPERATING SEQUENCE — AIR COOLED CHILLER & PUMP

Chiller — Run Conditions:
The chiller shall be enabled to run whenever:
• A definable number of chilled water coils need cooling
• AND the outside air temperature is greater than 50F (adj).

To prevent short cycling, the chiller shall run for and be off for minimum adjustable times (both user definable), unless shutdown on safeties or outside air conditions.

The chiller shall run subject to its own internal safeties and controls.

Emergency Shutdown:
The chiller shall shut down and an alarm generated upon receiving an emergency shutdown signal status.

Chilled Water Pump:
The chilled water pump shall run anytime the chiller is called to run. The chilled water pump shall also run for freeze protection whenever the outside air temperature is less than a user definable setpoint (adj).

The chilled water pump shall start prior to the chiller being enabled and shall stop only after the chiller is disabled. The chilled water pump shall therefore have:
• A user adjustable delay on start.
• AND a user adjustable delay on stop.

The delay times shall be set appropriately to allow for orderly chilled water system start-up, shutdown and sequencing.

Alarms shall be provided as follows:
• Chilled Water Pump Failure: Commanded on, but the status is off.
• Chilled Water Pump Running in Hand: Commanded off, but the status is on.
• Chilled Water Pump Runtime Exceeded: Status runtime exceeds a user definable limit.

Chiller:
The chiller shall be enabled a user adjustable time after pump statuses are proven on. The chiller shall therefore have a user adjustable delay on start.

The delay time shall be set appropriately to allow for orderly chilled water system start-up, shutdown and sequencing.

The chiller shall run subject to its own internal safeties and controls.

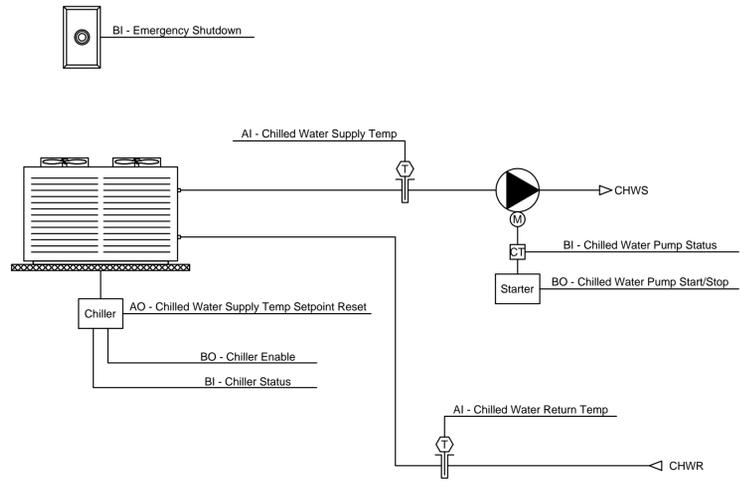
Alarms shall be provided as follows:
• Chiller Failure: Commanded on, but the status is off.
• Chiller Running in Hand: Commanded off, but the status is on.
• Chiller Runtime Exceeded: Status runtime exceeds a user definable limit.

Chilled Water Supply Temperature Setpoint:
The chilled water supply temperature setpoint shall reset based on outside air temperature.

As outside air temperature drops from 75F (adj.) to 50F (adj.) the chilled water supply temperature setpoint shall reset upwards by adding from 0F (adj.) to 10F (adj.) to the current setpoint.

Chilled Water Temperature Monitoring:
The following temperatures shall be monitored:
• Chilled water supply.
• Chilled water return.

Alarms shall be provided as follows:
• High Chilled Water Supply Temp: If the chilled water supply temperature is greater than 55F (adj.).
• Low Chilled Water Supply Temp: If the chilled water supply temperature is less than 38F (adj.).



EQUIPMENT CONTROL SCHEMATIC — AIR COOLED CHILLER

ZONE	HARDWARE POINTS				SOFTWARE POINTS							SHOW ON GRAPHIC
	AI	AO	BI	BO	AV	BV	LOOP	SCHED	TREND	ALARM		
CHW SUPPLY TEMP.	X									X		X
CHW RETURN TEMP.	X									X		X
CHW SUPPLY TEMP RESET SETPOINT		X								X		X
EMERGENCY SHUTDOWN			X							X	X	X
CHW PUMP STATUS			X							X		X
CHILLER STATUS			X							X		X
CHW PUMP START/STOP				X								X
CHILLER ENABLE				X								X
OUTSIDE AIR TEMP.					X							X
CHW PUMP FAILURE											X	
CHW PUMP RUNNING IN HAND											X	
CHW PUMP RUNTIME EXCEEDED											X	
CHILLER FAILURE											X	
CHILLER RUNNING IN HAND											X	
CHILLER RUNTIME EXCEEDED											X	
HIGH CHW SUPPLY TEMP.											X	
LOW CHW SUPPLY TEMP.											X	

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M-4
EXISTING CHILLER CONTROL SEQUENCE
NOT TO SCALE