

1 2 3 4 5 6

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D
C
B
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MECHANICAL SHEET INDEX	
SHEET NO	SHEET TITLE
G000	COVER SHEET
M001	MECHANICAL LEGENDS
M002	MECHANICAL NOTES
M003	MECHANICAL COMCHECK
M101	ADMINISTRATION BUILDING MECHANICAL PLAN
M102	DETENTION HOUSING MECHANICAL PLANS
M103	LONG TERM HOUSING MECHANICAL PLANS
M601	MECHANICAL SCHEDULES



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CONSULTANTS



VARIOUS ENERGY IMPROVEMENTS SLATE CANYON YOUTH CENTER

**DIVISION OF JUVENILE JUSTICE SERVICES
1991 SOUTH STATE STREET
PROVO, UTAH 84606**

DFCM PROJECT NUMBER: 11335430



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CENTER

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MARK	DATE	DESCRIPTION
ISSUE: CONSTRUCTION DRAWINGS		
DATE:		2011-11-09

PROJECT NO:	20110156
DRAWN BY:	ARA
CHECKED BY:	RWM
DESIGNED BY:	RWM
RECORD DRAWING DATE:	

SIGNATURE:
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SHEET TITLE

COVER SHEET

G000

1 2 3 4 5 6

MISC. SYMBOL LEGEND

Table with 2 columns: SYMBOL, DESCRIPTION. Includes symbols for sheet numbers, elevations, room numbers, keynotes, and plumbing fixtures.

PLUMBING PIPING LEGEND

Table with 2 columns: SYMBOL, DESCRIPTION. Lists plumbing piping types such as CW (Combination Waste and Vent), SW (Soil Waste), and GW (Grease Waste).

VALVE LEGEND

Table with 2 columns: SYMBOL, DESCRIPTION. Lists various valves including shut off, gate, check, auto, globe, ball, relief, pressure reducing, butterfly, and solenoid valves.

DUCTWORK LEGEND

Table with 3 columns: SINGLE LINE, DOUBLE LINE, DESCRIPTION. Lists ductwork types such as rectangular supply/return/exhaust ducts and round ducts.

ABBREVIATIONS

Table of abbreviations for mechanical and electrical symbols, including terms like AHU, BMS, BTU, CFM, and various pipe materials.

SCOPE OF WORK

- ECM 1 - [ADMINISTRATION BUILDING] INTEGRATE VAV BOXES WITH CENTRAL BMS GLOBAL CONTROLLER.
ECM 2 - REDUCE BOILER HOT WATER PUMP USAGE.
ECM 3 - INSTALL PREMIUM EFFICIENCY MOTORS.
ECM 4 - [ADMINISTRATION BUILDING] OPTIMIZE AHU-1 ECONOMIZER OPERATION.
ECM 5 - [ADMINISTRATION BUILDING] REPLACE EXISTING CHILLER WITH A HIGH-EFFICIENCY CHILLER.
ECM 6 - IMPLEMENT LIGHTING UPGRADE.
ECM 7 - [DETECTION CENTER] INSTALL PIPE INSULATION.
ECM 8 - INSTALL LOW FLOW FAUCETS.

Table with 4 columns: EQUIPMENT ITEM, DESCRIPTION, MOTOR SIZE, AREA SERVED. Lists equipment like AHU-1, MZ-1, MZ-2, MZ-3, MUA-1, HWP-1 through HWP-8.

- ECM 4 - [ADMINISTRATION BUILDING] OPTIMIZE AHU-1 ECONOMIZER OPERATION.
ECM 5 - [ADMINISTRATION BUILDING] REPLACE EXISTING CHILLER WITH A HIGH-EFFICIENCY CHILLER.
ECM 6 - IMPLEMENT LIGHTING UPGRADE.
ECM 7 - [DETECTION CENTER] INSTALL PIPE INSULATION.
ECM 8 - INSTALL LOW FLOW FAUCETS.

SEQUENCE OF OPERATION

- HOT WATER HEATING SYSTEM
1. EXISTING SEQUENCE OF OPERATION FOR THE HEATING SYSTEM SHALL REMAIN.
2. THE HOT WATER HEATING PUMPS SHALL OPERATE ON A LEAD/LAG BASIS.
3. THE HOT WATER HEAT PUMPS SHALL OPERATE ONLY DURING THE HEATING SEASON.
AIR HANDLING UNITS (AH-1).
1. EXISTING SEQUENCE OF OPERATION FOR THE AIR HANDLING UNIT SHALL REMAIN.
2. THE EXISTING VAV BOXES SHALL BE INTEGRATED INTO THE CENTRAL BUILDING MANAGEMENT SYSTEM.



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Table with 3 columns: MARK, DATE, DESCRIPTION. Includes design development date 2011-06-01.

PROJECT NO: 20110156
DRAWN BY: ARA
CHECKED BY: RWM
DESIGNED BY: RWM
RECORD DRAWING DATE:
SIGNATURE:
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MECHANICAL LEGENDS
M001

GENERAL EQUIPMENT NOTES

- 1. ALL CAPACITIES ARE AT JOB SITE CONDITIONS AND ARE MINIMUM CAPACITY.
- 2. ALL AIR CONDITIONING EQUIPMENT SHALL BE A.R.I. CERTIFIED AND THIRD PARTY LISTED.
- 3. ALL MECHANICAL EQUIPMENT SHALL BE INSTALLED TO CONFORM WITH LOCAL SEISMIC REQUIREMENTS AND THE REQUIREMENTS OF THESE CONSTRUCTION DOCUMENTS.
- 4. VERIFY ALL REQUIRED SERVICE CONNECTIONS, INCLUDING ELECTRICAL CHARACTERISTICS FOR ALL EQUIPMENT WITH ELECTRICAL CONTRACTOR PRIOR TO ORDERING EQUIPMENT.
- 5. ALL EQUIPMENT SHALL BE INDEPENDENTLY SUPPORTED FROM STRUCTURAL MEMBERS.
- 6. ALL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S WRITTEN INSTALLATION INSTRUCTIONS.
- 7. ALL SIMILAR EQUIPMENT SHALL BE OF THE SAME MANUFACTURER.
- 8. AIR INLETS AND OUTLETS SHALL BE OF THE SAME MANUFACTURER.
- 9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE HVAC EQUIPMENT CHECK-IN, SAFEKEEPING, AND DAMAGE.

SEISMIC DESIGN REQUIREMENTS

- 1. THE SEISMIC REQUIREMENTS FOR THIS PROJECT SHALL BE IN ACCORDANCE WITH CHAPTER 17 OF THE 2009 INTERNATIONAL BUILDING CODE (IBC) AND CHAPTER 13 OF THE AMERICAN SOCIETY OF CIVIL ENGINEERS (ASCE) 7-05 'MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES'.
- 2. SEISMIC DESIGN CATEGORY FOR THIS PROJECT IS 'D'. (ASCE 7-05 TABLE 11.6-1 AND TABLE 11.6-2)
- 3. OCCUPANCY CATEGORIES: (ASCE 7-05, TABLE 1-1)
 - a. ENTIRE BUILDING EXCEPT SALES AREA; OCCUPANCY CATEGORY = I
 - b. SALES AREA (OCCUPANCY MORE THAN 300); OCCUPANCY CATEGORY = II
- 4. BUILDING IMPORTANCE FACTOR (ASCE 7-05 TABLE 11.5-1)
 - a. ENTIRE BUILDING EXCEPT SALES AREA; IMPORTANCE FACTOR, I = 1.00
 - b. SALES AREA (OCCUPANCY MORE THAN 300); IMPORTANCE FACTOR, I = 1.25
- 5. COMPONENT IMPORTANCE FACTOR (IP) SHALL EQUAL = 1.0 EXCEPT AS NOTED BELOW:
 - a. COMPONENT IMPORTANCE FACTOR (IP) SHALL EQUAL = 1.5 IS ANY FO THE FOLLOWING CONDITIONS APPLY:
 - i. COMPONENT IS REQUIRED FOR FUNCTION FOR LIFE-SAFETY PURPOSES (i.e. FIRE PROTECTION SPRINKLER SYSTEMS).
 - ii. COMPONENT CONTAINS HAZARDOUS MATERIALS (i.e. OXYGEN PIPING SYSTEM, OR NATURAL GAS PIPING SYSTEM).
 - iii. COMPONENT IS PART OF AN ESSENTIAL FACILITY THAT MUST FUNCTION AFTER A SEISMIC EVENT.
- 6. SPECIAL INSPECTIONS ARE REQUIRED FOR MECHANICAL AND PLUMBING COMPONENTS IN ACCORDANCE WITH SECTION 1707.7 OF CHAPTER 17 OF THE 2009 INTERNATIONAL BUILDING CODE (IBC).
 - a. PERIODIC SPECIAL INSPECTIONS ARE REQUIRED DURING INSTALLATION OF NATURAL GAS PIPING AND THEIR ASSOCIATED MECHANICAL UNITS. (NATURAL GAS IS CONSIDERED FLAMMABLE AND COMBUSTIBLE)
 - b. PERIODIC SPECIAL INSPECTIONS ARE REQUIRED DURING THE INSTALLATION OF GREASE EXHAUST DUCTWORK.
 - c. PERIODIC SPECIAL INSPECTION ARE REQUIRED DURING THE INSTALLATION FOR ALL MECHANICAL EQUIPMENT SUPPORTED BY VIBRATION ISOLATOR SYSTEMS WHERE THE CONSTRUCTION DOCUMENTS REQUIRE A NOMINAL CLEARANCE OF 1/4 INCH OR LESS BETWEEN THE EQUIPMENT SUPPORT FRAME AND RESTRAINT.
- 7. PROVIDE MANUFACTURER'S SEISMIC CERTIFICATION OF COMPLIANCE FOR ALL MECHANICAL EQUIPMENT.
 - a. FOR COMPONENT IMPORTANCE FACTOR GREATER THAN 1.00 THE SEISMIC CERTIFICATION OF COMPLIANCE SHALL BE BASED ON:
 - i. AN ACTUAL TEST ON A SHAKE TABLE or
 - ii. BY THREE-DIMENSIONAL SHOCK TESTS or
 - iii. BY AN ANALYTICAL METHOD USING DYNAMIC CHARACTERISTICS AND FORCES or
 - iv. BY THE USE OF EXPERIENCE DATA (I.E. HISTORICAL DATA DEMONSTRATING ACCEPTABLE SEISMIC PERFORMANCE) or
 - v. BY MORE RIGOROUS ANALYSIS PROVIDING FOR EQUIVALENT SAFETY.
 - b. FOR COMPONENT IMPORTANCE FACTOR EQUAL TO ONE (1) THE SEISMIC CERTIFICATION OF COMPLIANCE SHALL BE BASED ON ANALYSIS, TESTING OR EXPERIENCE DATA.
 - c. EXCEPTION: THE FOLLOWING COMPONENTS ARE EXEMPT FROM THESE REQUIREMENTS:
 - i. EQUIPMENT WITH FLEXIBLE CONNECTIONS PROVIDED BETWEEN COMPONENT AND ASSOCIATED DUCTWORK, PIPING AND ELECTRICAL CONDUIT, AND
 - ii. COMPONENTS WEIGHING LESS THAN 400 LBS. AND ARE MOUNTED NO MORE THAN 4 FEET ABOVE FLOOR LEVEL, AND
 - iii. COMPONENTS WEIGHING LESS THAN 20 LBS. AND ARE ATTACHED TO CEILING, OR WALL, AND
 - iv. COMPONENTS CONSISTING OF A DISTRIBUTION SYSTEM WEIGHING 5 LBS./FT. OR LESS.

MECHANICAL SUBMITTAL NOTES

- 1. MECHANICAL SUBMITTAL SHALL BE SUBMITTED AS A COMPLETE ELECTRONIC PACKAGE ASSEMBLED BY SPECIFICATION DIVISIONS.
- 2. ASSEMBLE COMPLETE ELECTRONIC SUBMITTAL PACKAGE INTO A SINGLE INDEXED FILE INCORPORATING SUBMITTAL REQUIREMENTS OF A SINGLE SPECIFICATION SECTION AND TRANSMITTAL WITH LINKS ENABLING NAVIGATION TO EACH ITEM:
 - a. LITERATURE SHALL INCLUDE REFERENCE TO EQUIPMENT CALLOUT AND SPECIFICATION SECTION.
 - b. FILE NAME SHALL USE PROJECT IDENTIFIER AND SPECIFICATION SECTION NUMBER FOLLOWED BY A DECIMAL POINT AND THEN A SEQUENTIAL NUMBER (E.G., LNHS-061000.01). RESUBMITTALS SHALL INCLUDE AN ALPHABETIC SUFFIX AFTER ANOTHER DECIMAL POINT (E.G., LNHS-061000.01.A).
 - c. PROVIDE MANUFACTURER'S CATALOG DATA SHEETS FOR EACH MANUFACTURED ITEM LISTED ON THE DRAWINGS AND SPECIFICATIONS.
 - d. INCLUDE MANUFACTURER'S CATALOG DATA OF EACH MANUFACTURED ITEM AND ENOUGH INFORMATION TO SHOW COMPLIANCE WITH CONTRACT DOCUMENT REQUIREMENTS.
 - e. LITERATURE SHALL SHOW CAPACITIES AND SIZE OF EQUIPMENT USED AND BE MARKED INDICATING EACH SPECIFIC ITEM WITH APPLICABLE DATA UNDERLINED.
 - f. INCLUDE NAME, ADDRESS, AND PHONE NUMBER OF EACH SUPPLIER.
 - g. DEVIATIONS AND ADDITIONAL INFORMATION: ON AN ATTACHED SEPARATE SHEET, PREPARED ON CONTRACTOR'S LETTERHEAD, RECORD RELEVANT INFORMATION, REQUESTS FOR DATA, REVISIONS OTHER THAN THOSE REQUESTED BY ENGINEER CONTRACT DOCUMENTS, INCLUDING MINOR VARIATIONS AND LIMITATIONS. INCLUDE SAME IDENTIFICATION INFORMATION AS RELATED SUBMITTAL.
- 3. PRODUCT DATA:
 - a. COLLECT INFORMATION INTO A SINGLE SUBMITTAL FOR EACH ELEMENT OF CONSTRUCTION AND TYPE OF PRODUCT OR EQUIPMENT.
 - b. IF INFORMATION MUST BE SPECIALLY PREPARED FOR SUBMITTAL BECAUSE STANDARD PUBLISHED DATA ARE NOT SUITABLE FOR USE, SUBMIT AS SHOP DRAWINGS, NOT AS PRODUCT DATA.
 - c. MARK EACH COPY OF EACH SUBMITTAL TO SHOW WHICH PRODUCTS AND OPTIONS ARE APPLICABLE.
 - d. INCLUDE THE FOLLOWING INFORMATION, AS APPLICABLE:
 - e. MANUFACTURER'S CATALOG CUTS.
 - f. MANUFACTURER'S PRODUCT SPECIFICATIONS.
 - g. STANDARD COLOR CHARTS.
 - h. STATEMENT OF COMPLIANCE WITH SPECIFIED REFERENCED STANDARDS.
 - i. TESTING BY RECOGNIZED TESTING AGENCY.
 - j. APPLICATION OF TESTING AGENCY LABELS AND SEALS.
 - k. NOTATION OF COORDINATION REQUIREMENTS.
 - l. AVAILABILITY AND DELIVERY TIME INFORMATION.
 - m. FOR EQUIPMENT, INCLUDE THE FOLLOWING IN ADDITION TO THE ABOVE, AS APPLICABLE:
 - n. WIRING DIAGRAMS SHOWING FACTORY-INSTALLED WIRING.
 - o. PRINTED PERFORMANCE CURVES.
 - p. OPERATIONAL RANGE DIAGRAMS.
 - q. CLEARANCES REQUIRED TO OTHER CONSTRUCTION, IF NOT INDICATED ON ACCOMPANYING SHOP DRAWINGS.
 - 4. SHOP DRAWINGS:
 - a. PREPARE PROJECT-SPECIFIC INFORMATION, DRAWN ACCURATELY TO SCALE. DO NOT BASE SHOP DRAWINGS ON REPRODUCTIONS OF THE CONTRACT DOCUMENTS OR STANDARD PRINTED DATA.
 - b. PREPARATION: FULLY ILLUSTRATE REQUIREMENTS IN THE CONTRACT DOCUMENTS. INCLUDE THE FOLLOWING INFORMATION, AS APPLICABLE:
 - i. IDENTIFICATION OF PRODUCTS.
 - ii. SCHEDULES.
 - iii. COMPLIANCE WITH SPECIFIED STANDARDS.
 - iv. NOTATION OF COORDINATION REQUIREMENTS.
 - v. NOTATION OF DIMENSIONS ESTABLISHED BY FIELD MEASUREMENT.
 - vi. RELATIONSHIP AND ATTACHMENT TO ADJOINING CONSTRUCTION CLEARLY INDICATED.
 - vii. SEAL AND SIGNATURE OF PROFESSIONAL ENGINEER IF SPECIFIED.
 - 5. PROCESSING TIME: ALLOW TIME FOR SUBMITTAL REVIEW, INCLUDING TIME FOR RESUBMITTALS, AS FOLLOWS. TIME FOR REVIEW SHALL COMMENCE ON ENGINEER'S RECEIPT OF SUBMITTAL. NO EXTENSION OF THE CONTRACT TIME WILL BE AUTHORIZED BECAUSE OF FAILURE TO TRANSMIT SUBMITTALS ENOUGH IN ADVANCE OF THE WORK TO PERMIT PROCESSING, INCLUDING RESUBMITTALS.
 - a. INITIAL REVIEW: ALLOW 15 DAYS FOR INITIAL REVIEW OF MECHANICAL SUBMITTAL.
 - b. RESUBMITTAL REVIEW: ALLOW 15 DAYS FOR REVIEW OF EACH RESUBMITTAL.
 - 6. DEVIATIONS AND ADDITIONAL INFORMATION: ON AN ATTACHED SEPARATE SHEET, PREPARED ON CONTRACTOR'S LETTERHEAD, RECORD RELEVANT INFORMATION, REQUESTS FOR DATA, REVISIONS OTHER THAN THOSE REQUESTED BY DESIGN ENGINEER ON PREVIOUS SUBMITTALS, AND DEVIATIONS FROM REQUIREMENTS IN THE CONTRACT DOCUMENTS, INCLUDING MINOR VARIATIONS AND LIMITATIONS. INCLUDE SAME IDENTIFICATION INFORMATION AS RELATED SUBMITTAL.

DUCT CONSTRUCTION NOTES

- 1. ALL RECTANGULAR AND ROUND DUCTWORK SHALL BE FABRICATED AND CONSTRUCTED TO COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE."
- 2. ALL DUCTWORK SHALL BE GALVANIZED SHEET METAL, EXCEPT WHERE INDICATED OTHERWISE.
 - a. ALL TRANSVERSE JOINTS SHALL BE FABRICATED AND INSTALLED ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," FIGURE 2-1, "RECTANGULAR DUCT TRANSVERSE JOINTS."
 - b. ALL LONGITUDINAL SEAMS SHALL BE FABRICATED AND INSTALLED ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," FIGURE 2-2, "RECTANGULAR DUCT LONGITUDINAL SEAMS."
 - c. ALL ELBOWS, TRANSITIONS, OFFSETS, BRANCH CONNECTIONS, AND OTHER FITTINGS AND COMPONENTS SHALL BE FABRICATED AND INSTALLED ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," CHAPTER 4, "FITTINGS AND OTHER CONSTRUCTION."
 - d. CROSS-BREAK ALL DUCT SURFACES 19" THROUGH 60". USE ANGLE REINFORCING FOR DUCTS SURFACES OVER 60".
 - e. PROVIDE SINGLE VANE TURNING VANES IN ALL ELBOWS AND CHANGES IN DIRECTION.
- 3. ALL RECTANGULAR AND ROUND DUCTWORK SHALL BE CONSTRUCTED TO THE FOLLOWING SHEET METAL DUCT STATIC PRESSURE CLASSIFICATION:
 - SUPPLY AIR DUCT: 2" W.C.
 - RETURN AIR DUCT: 2" W.C. (NEGATIVE)
 - EXHAUST AIR DUCT: 2" W.C. (NEGATIVE)
 - OUTSIDE AIR DUCT: 2" W.C.
- 4. RECTANGULAR DUCTWORK:
 - a. ALL TRANSVERSE JOINTS SHALL BE FABRICATED ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," FIGURE 3-1, "ROUND DUCT TRANSVERSE 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."
 - b. ALL LONGITUDINAL SEAMS SHALL BE FABRICATED AND INSTALLED ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," FIGURE 3-2, "ROUND DUCT LONGITUDINAL SEAMS" 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. ALL ROUND TEES AND LATERALS SHALL BE FABRICATED AND INSTALLED ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," FIGURE 3-5, "90 DEGREE TEES AND LATERALS," AND FIGURE 3-6, "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."
- 5. ROUND DUCTWORK:
 - a. APPROVED METHODS OF SEALING DUCTWORK INCLUDES TAPES, MASTICS, GASKETING OR OTHER APPROVED CLOSURE SYSTEMS.
 - b. TAPES AND MASTICS USED TO SEAL DUCTWORK MUST BE LISTED AND LABELED IN ACCORDANCE WITH UL 181A AND SHALL BE MARKED "181A-P FOR PRESSURE-SENSITIVE TAPE, "181A-M" FOR MASTIC OR "181A-H FOR HEAT-SENSITIVE TAPE.
 - c. TAPES AND MASTICS USED TO SEAL FLEXIBLE AIR DUCTS SHALL COMPLY WITH UL 181B AND SHALL BE MARKED "181B-FX" FOR PRESSURE SENSITIVE TAPE, OR 181B-M FOR MASTIC.
 - d. MECHANICAL FASTENERS USED WITH FLEXIBLE NON-METALLIC AIR DUCTS SHALL COMPLY WITH UL 181 AND SHALL BE MARKED "181B-".
 - e. TAPE ALONE CANNOT BE SUBSTITUTED FOR MECHANICAL FASTENERS
 - f. DO NOT USE GRAY DUCT TAPE, FOIL BACKED TAPE, OIL BASED CAULKING AND GLAZING COMPOUNDS TO SEAL METAL DUCTS.
- 6. ALL TRANSVERSE JOINTS AND LONGITUDINAL SEAMS ON ALL RECTANGULAR AND ROUND DUCTWORK SHALL BE SEAL TO SMACNA SEAL CLASS B.
 - a. SUPPORT ALL METAL DUCTWORK FROM STRUCTURAL MEMBERS.
 - i. ALL DUCT SUPPORTS SHALL BE GALVANIZED STEEL.
 - ii. DUCT SUPPORTS SHALL NOT BE ATTACHED TO ROOF DECK.
 - iii. DUCT SUPPORTS SHALL NOT BE ATTACHED TO STRUCTURAL CROSS BRACING.
 - iv. HANGER STRAPS AND HANGER ROD SIZES FOR RECTANGULAR DUCTWORK SHALL COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," TABLE 5-1 "RECTANGULAR DUCT HANGERS MINIMUM SIZE."
 - v. HANGER STRAPS AND HANGER ROD SIZES FOR ROUND DUCTWORK SHALL COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," TABLE 5-2, "MINIMUM HANGER SIZES FOR ROUND DUCT."
 - f. SUSPEND ALL METAL DUCTWORK NOT EXCEEDING 30" LONGEST SIDE AT EVERY JOINT. DO NOT EXCEED 10'-0" HANGER SPACING. USE 1" X 18 GAGE GALVANIZED STRAPS (MINIMUM) ATTACHED TO BOTTOM AND SIDES OF DUCT
 - g. SUSPEND ALL METAL DUCTWORK EXCEEDING 30" LONGEST SIDE AT MAXIMUM 8'-0" SPACING USING ANGLES AND RODS.
- 7. DUCT SIZES SHALL BE VERIFIED FOR CLEARANCES AT THE JOB SITE PRIOR TO FABRICATION. DIMENSIONS MAY BE CHANGED TO ACCOMMODATE CONSTRUCTION CLEARANCES. FREE AREA OF DUCT SHALL BE MAINTAINED.
- 8. DUCT TRANSITIONS SHALL BE CONSTRUCTED WITH SLOPE OF 1/4.
- 9. FLEXIBLE CONNECTORS SHALL NOT BE USED.

GENERAL MECHANICAL NOTES

- 1. THE MECHANICAL DRAWINGS SHOW THE GENERAL DESIGN, ARRANGEMENT AND EXTENT OF THE MECHANICAL SYSTEM. BECAUSE OF THE SMALL SCALE OF THE DRAWINGS, THESE DRAWINGS DO NOT SHOW ALL OFFSETS, BENDS OR ELBOWS NECESSARY FOR THE COMPLETE INSTALLATION IN THE SPACE PROVIDED. CONTRACTOR SHALL MAKE SUCH MINOR ALTERATIONS AS MAY BE NECESSARY TO MAKE THE SYSTEM COMPLETE AND OPERATIONAL IN ACCORDANCE WITH THE DESIGN INTENT.
- 2. MAJOR DEVIATIONS SUCH AS CHANGES IN COMPONENT SIZES, WEIGHTS, QUANTITIES OR MATERIAL WILL REQUIRE PRIOR APPROVAL BY THE DESIGN ENGINEER.
- 3. THE DRAWINGS AND SPECIFICATIONS HAVE BEEN PREPARED TO SUPPLEMENT EACH OTHER AND SHALL BE INTERPRETED AS IN INTEGRAL UNIT WITH THE ITEMS SHOWN ON ONE AND NOT THE OTHER BEING FURNISHED AND INSTALLED AS THOUGHT SHOWN AND CALLOUT IN BOTH.
- 4. THE ENTIRE MECHANICAL INSTALLATION SHALL CONFORM TO THE REQUIREMENTS OF THE MOST RECENTLY ADOPTED BUILDING CODES, MECHANICAL CODE, PLUMBING CODE, ELECTRICAL CODE, AND ALL OTHER APPLICABLE CITY, COUNTY, STATE, AND FEDERAL CODES AND REGULATIONS IN EFFECT.
- 5. THE ENTIRE MECHANICAL INSTALLATION SHALL CONFORM TO ALL CODES, RULES, REGULATIONS AND SPECIAL REQUIREMENTS OF THE BUILDING OWNER.
- 6. PRIOR TO FABRICATION AND INSTALLATION OF ANY MECHANICAL COMPONENT THE CONTRACTOR SHALL COORDINATE THE INSTALLATION OF ALL MECHANICAL WORK WITH ALL OTHER BUILDING TRADES, INCLUDING BUILDING TRADES HIRED DIRECTLY BY THE OWNER. WHERE CONFLICTS MAY OCCUR, THEY SHALL BE RESOLVED PRIOR TO INSTALLATION.
- 7. THE SPACE ABOVE ALL CEILINGS IS LIMITED. CAREFUL COORDINATION IS REQUIRED WITH ALL TRADES BEFORE ANY PIPE, DUCT, OR EQUIPMENT IS ORDERED AND OR INSTALLED. ANY CONFLICTS AND/OR CHANGES FOUND DURING INSTALLATION THAT RESULTS FROM THE LACK OF COORDINATION BY THE CONTRACTORS DURING THE SHOP DRAWING PROCESS ARE THE RESPONSIBILITY OF THE CONTRACTOR.
- 8. ALL MECHANICAL INFORMATION IS NOT SHOWN ON THE MECHANICAL DRAWINGS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL INFORMATION ON ALL OTHER CONSTRUCTION DOCUMENT.
- 9. THE CONTRACTOR SHALL BE RESPONSIBLE TO REVIEW AND USE, WHERE APPROPRIATE, ALL THE MECHANICAL DETAILS SHOWN ON THE DRAWINGS. DETAILS MAY OR MAY NOT BE CALLED OUT ON THE DRAWINGS WITH SYMBOLS OR KEYED NOTES. ANY CHANGES RESULTING FROM FAILURE TO INSTALL THE MECHANICAL SYSTEM WITHOUT USING THE INCLUDED DETAILS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
- 10. THE STRUCTURE SHOWN ON ALL DETAILS MAY OR MAY NOT PERTAIN TO A PORTION OR ANY PORTION OF THE BUILDING. COORDINATED ALL MOUNTING REQUIREMENTS WITH ARCHITECTURAL AND STRUCTURAL DRAWINGS.
- 11. ANY PART OF THE MECHANICAL INSTALLATION THAT FAILS, IS UNFIT, OR BECOMES DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED OR REPLACES BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
- 12. SEE ARCHITECTURAL REFLECTED CEILING PLAN FOR EXACT LOCATION OF ALL CEILING DIFFUSERS AND GRILLES.
- 13. CONTRACTOR SHALL OPERATE THE SYSTEM AND DEMONSTRATE ALL ASPECTS OF THE SYSTEM TO THE ENGINEER AND/OR OWNER TO PROVE ALL SYSTEMS ARE OPERATIONAL.
- 14. DURING CONSTRUCTION, THE CONTRACTOR SHALL MAINTAIN A SET OF AS-BUILT REFINED RECORD DRAWING AT THE PROJECT SITE. ALL CHANGES IN LAYOUT, ROUTING, EQUIPMENT, COMPONENTS, AND ACCESSORIES SHALL BE RECORDED. THESE REFINED DRAWINGS SHALL BE GIVEN TO THE ARCHITECT/ENGINEER AFTER THE FINAL INSPECTION IN ACCORDANCE WITH SPECIFICATIONS.



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MARK	DATE	DESCRIPTION
ISSUE:	DESIGN DEVELOPMENT	
DATE:	2011-06-01	
PROJECT NO:	20110156	
DRAWN BY:	ARA	
CHECKED BY:	RWM	
DESIGNED BY:	RWM	
RECORD DRAWING DATE:		
SIGNATURE:		
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SHEET TITLE		

MECHANICAL NOTES
M002

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COMcheck Software Version 3.8.2 Mechanical Compliance Certificate

2009 IECC

Section 1: Project Information

Project Type: **New Construction**
Project Title: **Slate Canyon Youth Facility**

Construction Site: 1991 South State Street, Provo, UT 84606
Owner/Agent: DFCM
Designer/Contractor: Ray Moore, Spectrum Engineers, 324 S. State Street, Suite 400, Salt Lake City, UT 84111, (801) 328-5151

Section 2: General Information

Building Location (for weather data): **Roy, Utah**
Climate Zone: **5b**

Section 3: Mechanical Systems List

Quantity	System Type & Description
1	Plant 1: Cooling: Water Chiller, Capacity 56 tons, Condenser Air-Cooled, Efficiency: 9.80 EER, Rotary Screw or Scroll Chiller

Section 4: Requirements Checklist

Requirements Specific To: Plant 1 :

- 1. Equipment minimum efficiency: Chiller: 9.562 EER (12.50 IPLV)
- 2. Hot gas bypass limited to 50% of total cooling capacity
- 3. Meets the condenser heat recovery requirement for service water heating
 - Exception: Facilities that employ condenser heat recovery for space heating with a heat recovery design exceeding 30% of the peak water-cooled condenser load at design conditions.
 - Exception: Facilities that provide 60% of their service water heating from site solar or site recovered energy or from other sources.
- 4. Chilled water pumping systems with multiple chillers must automatically reduce chilled water flow rates proportionately when chillers are not operating

Generic Requirements: Must be met by all systems to which the requirement is applicable:

- 1. Plant equipment and system capacity no greater than needed to meet loads
 - Exception: Standby equipment automatically off when primary system is operating
 - Exception: Multiple units controlled to sequence operation as a function of load
- 2. Minimum one temperature control device per system
- 3. Minimum one humidity control device per installed humidification/dehumidification system
- 4. Load calculations per ASHRAE/ACCA Standard 183
- 5. Automatic Controls: Setback to 55°F (heat) and 85°F (cool); 7-day clock, 2-hour occupant override, 10-hour backup
 - Exception: Continuously operating zones
 - Exception: 2 kW demand or less, submit calculations
- 6. Outside-air source for ventilation; system capable of reducing OSA to required minimum
- 7. Hot water pipe insulation: 1.5 in. for pipes <= 1.5 in. and 2 in. for pipes > 1.5 in.
Chilled water/refrigerant/brine pipe insulation: 1.5 in. for pipes <= 1.5 in. and 1.5 in. for pipes > 1.5 in.

Project Title: Slate Canyon Youth Facility
Data filename: I:\17-PROGRAM DOCUMENTS\Comcheck Reports\Weber Valley Youth Center.ck
Report date: 10/05/11
Page 1 of 4

- Steam pipe insulation: 1.5 in. for pipes <= 1.5 in. and 3 in. for pipes > 1.5 in.
 - Exception: Piping within HVAC equipment.
 - Exception: Fluid temperatures between 55 and 105°F.
 - Exception: Fluid not heated or cooled with renewable energy.
 - Exception: Piping within room fan-coil (with AHRI440 rating) and unit ventilators (with AHRI840 rating).
 - Exception: Runouts < 4 ft in length.
- 8. Operation and maintenance manual provided to building owner
- 9. Demand control ventilation (DCV) present for high design occupancy areas (>40 person/1000 ft2 in spaces >500 ft2) and served by systems with any one of 1) an air-side economizer, 2) automatic modulating control of the outdoor air damper, or 3) a design outdoor airflow greater than 3000 cfm.
 - Exception: Systems with heat recovery.
 - Exception: Multiple-zone systems without DDC of individual zones communicating with a central control panel.
 - Exception: Systems with a design outdoor airflow less than 1200 cfm.
 - Exception: Spaces where the supply airflow rate minus any makeup or outgoing transfer air requirement is less than 1200 cfm.
- 10. Automatic controls for freeze protection systems present
- 11. Exhaust air heat recovery included for systems 5,000 cfm or greater with more than 70% outside air fraction or specifically exempted
 - Exception: Hazardous exhaust systems, commercial kitchen and clothes dryer exhaust systems that the International Mechanical Code prohibits the use of energy recovery systems.
 - Exception: Systems serving spaces that are heated and not cooled to less than 60°F.
 - Exception: Where more than 60 percent of the outdoor heating energy is provided from site-recovered or site solar energy.
 - Exception: Heating systems in climates with less than 3600 HDD.
 - Exception: Cooling systems in climates with a 1 percent cooling design wet-bulb temperature less than 64°F.
 - Exception: Systems requiring dehumidification that employ energy recovery in series with the cooling coil.
 - Exception: Laboratory fume hood exhaust systems that have either a variable air volume system capable of reducing exhaust and makeup air volume to 50 percent or less of design values or, a separate make up air supply meeting the following makeup air requirements: a) at least 75 percent of exhaust flow rate, b) heated to no more than 2°F below room setpoint temperature, c) cooled to no lower than 3°F above room setpoint temperature, d) no humidification added, e) no simultaneous heating and cooling.

Section 5: Compliance Statement

Compliance Statement: The proposed mechanical design represented in this document is consistent with the building plans, specifications and other calculations submitted with this permit application. The proposed mechanical systems have been designed to meet the 2009 IECC requirements in COMcheck Version 3.8.2 and to comply with the mandatory requirements in the Requirements Checklist.

Name - Title: Ray W. Moore, P.E. Signature: [Signature] Date: 10/05/2011

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Report date: 10/05/11
Page 2 of 4



COMcheck Software Version 3.8.2 Mechanical Requirements Description

2009 IECC

The following list provides more detailed descriptions of the requirements in Section 4 of the Mechanical Compliance Certificate.

Requirements Specific To: Plant 1 :

1. The specified heating and/or cooling equipment is covered by the ASHRAE 90.1 Code and must meet the following minimum efficiency: Chiller: 9.562 EER (12.50 IPLV)
2. For cooling systems <= 240 kBtu/h, maximum hot gas bypass capacity must be no more than 50% total cooling capacity.
3. Condenser heat recovery systems must be installed for heating or preheating of service hot water provided if:
 - a) The facility operates 24 hours a day,
 - b) The total installed heat rejection capacity of the water-cooled systems exceeds 6,000 kBtu/h of heat rejection,
 - c) The design service water heating load exceeds 1,000 kBtu/h.
 The required heat recovery system must have the capacity to provide the smaller of:
 - a) 60% of the peak heat rejection load at design conditions, or
 - b) preheat of the peak service hot water drain to 85 degrees F.
 - Exception: Facilities that employ condenser heat recovery for space heating with a heat recovery design exceeding 30% of the peak water-cooled condenser load at design conditions.
 - Exception: Facilities that provide 60% of their service water heating from site solar or site recovered energy or from other sources.
4. When a chilled water plant includes more than one chiller, provisions must be made so that the flow in the chiller plant can be automatically reduced, proportionately when one or more chiller is shut down. Chillers that are piped in series for the purpose of increasing the temperature differential must be considered as one chiller.

Generic Requirements: Must be met by all systems to which the requirement is applicable:

1. All equipment and systems must be sized to be no greater than needed to meet calculated loads. A single piece of equipment providing both heating and cooling must satisfy this provision for one function with the capacity for the other function as small as possible, within available equipment options.
 - Exception: The equipment and/or system capacity may be greater than calculated loads for standby purposes. Standby equipment must be automatically controlled to be off when the primary equipment and/or system is operating.
 - Exception: Multiple units of the same equipment type whose combined capacities exceed the calculated load are allowed if they are provided with controls to sequence operation of the units as the load increases or decreases.
2. Each heating or cooling zone serving a single zone must have its own temperature control device.
3. Each humidification system must have its own humidity control device.
4. Design heating and cooling loads for the building must be determined using procedures in the ASHRAE Handbook of Fundamentals or an approved equivalent calculation procedure.
5. The system or zone control must be a programmable thermostat or other automatic control meeting the following criteria:
 - a) capable of setting back temperature to 55°F during heating and setting up to 85°F during cooling,
 - b) capable of automatically setting back or shutting down systems during unoccupied hours using 7 different day schedules,
 - c) have an accessible 2-hour occupant override,
 - d) have a battery back-up capable of maintaining programmed settings for at least 10 hours without power.
 - Exception: A setback or shutoff control is not required on thermostats that control systems serving areas that operate continuously.
 - Exception: A setback or shutoff control is not required on systems with total energy demand of 2 kW (6,826 Btu/h) or less.
6. The system must supply outside ventilation air as required by Chapter 4 of the International Mechanical Code. If the ventilation system is designed to supply outdoor-air quantities exceeding minimum required levels, the system must be capable of reducing outdoor-air flow to the minimum required levels.
7. All pipes serving space-conditioning systems must be insulated as follows:
 - Hot water piping for heating systems:
 - 1 1/2 in. for pipes <= 1 1/2-in. nominal diameter,
 - 2 in. for pipes > 1 1/2-in. nominal diameter.
 - Chilled water, refrigerant, and brine piping systems:
 - 1 1/2 in. insulation for pipes <= 1 1/2-in. nominal diameter,
 - 1 1/2 in. insulation for pipes > 1 1/2-in. nominal diameter.
 - Steam piping:

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Data filename: I:\17-PROGRAM DOCUMENTS\Comcheck Reports\Weber Valley Youth Center.ck
Report date: 10/05/11
Page 3 of 4

- 1 1/2 in. insulation for pipes <= 1 1/2-in. nominal diameter.
- 3 in. insulation for pipes > 1 1/2-in. nominal diameter.
- Exception: Pipe insulation is not required for factory-installed piping within HVAC equipment.
- Exception: Pipe insulation is not required for piping that conveys fluids having a design operating temperature range between 55°F and 105°F.
- Exception: Pipe insulation is not required for piping that conveys fluids that have not been heated or cooled through the use of fossil fuels or electric power.
- Exception: Piping within room fan-coil (with AHRI440 rating) and unit ventilators (with AHRI840 rating).
- Exception: Pipe insulation is not required for runout piping not exceeding 4 ft in length and 1 in. in diameter between the control valve and HVAC coil.
- 8. Operation and maintenance documentation must be provided to the owner that includes at least the following information:
 - a) equipment capacity (input and output) and required maintenance actions
 - b) equipment operation and maintenance manuals
 - c) HVAC system control maintenance and calibration information, including wiring diagrams, schematics, and control sequence descriptions; desired or field-determined set points must be permanently recorded on control drawings, at control devices, or, for digital control systems, in programming comments
 - d) complete narrative of how each system is intended to operate.
- 9. Demand control ventilation (DCV) required for high design occupancy areas (>40 person/1000 ft2 in spaces >500 ft2) and served by systems with any one of 1) an air-side economizer, 2) automatic modulating control of the outdoor air damper, or 3) a design outdoor airflow greater than 3000 cfm.
 - Exception: Systems with heat recovery.
 - Exception: Multiple-zone systems without DDC of individual zones communicating with a central control panel.
 - Exception: Systems with a design outdoor airflow less than 1200 cfm.
 - Exception: Spaces where the supply airflow rate minus any makeup or outgoing transfer air requirement is less than 1200 cfm.
- 10. All freeze protection systems, including self-regulating heat tracing, must include automatic controls capable of shutting off the systems when outside air temperatures are above 40°F or when the conditions of the protected fluid will prevent freezing. Snow- and ice-melting systems must include automatic controls capable of shutting off the systems when the pavement temperature is above 50°F and no precipitation is falling, and an automatic or manual control that will allow shutoff when the outdoor temperature is above 40°F.
- 11. Individual fan systems with a design supply air capacity of 5000 cfm or greater and minimum outside air supply of 70 percent or greater of the supply air capacity must have an energy recovery system with at least a 50 percent effectiveness. Where cooling with outdoor air is required there is a means to bypass or control the energy recovery system to permit cooling with outdoor air.
 - Exception: Hazardous exhaust systems, commercial kitchen and clothes dryer exhaust systems that the International Mechanical Code prohibits the use of energy recovery systems.
 - Exception: Systems serving spaces that are heated and not cooled to less than 60°F.
 - Exception: Where more than 60 percent of the outdoor heating energy is provided from site-recovered or site solar energy.
 - Exception: Heating systems in climates with less than 3600 HDD.
 - Exception: Cooling systems in climates with a 1 percent cooling design wet-bulb temperature less than 64°F.
 - Exception: Systems requiring dehumidification that employ energy recovery in series with the cooling coil.
 - Exception: Laboratory fume hood exhaust systems that have either a variable air volume system capable of reducing exhaust and makeup air volume to 50 percent or less of design values or, a separate make up air supply meeting the following makeup air requirements: a) at least 75 percent of exhaust flow rate, b) heated to no more than 2°F below room setpoint temperature, c) cooled to no lower than 3°F above room setpoint temperature, d) no humidification added, e) no simultaneous heating and cooling.

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Report date: 10/05/11
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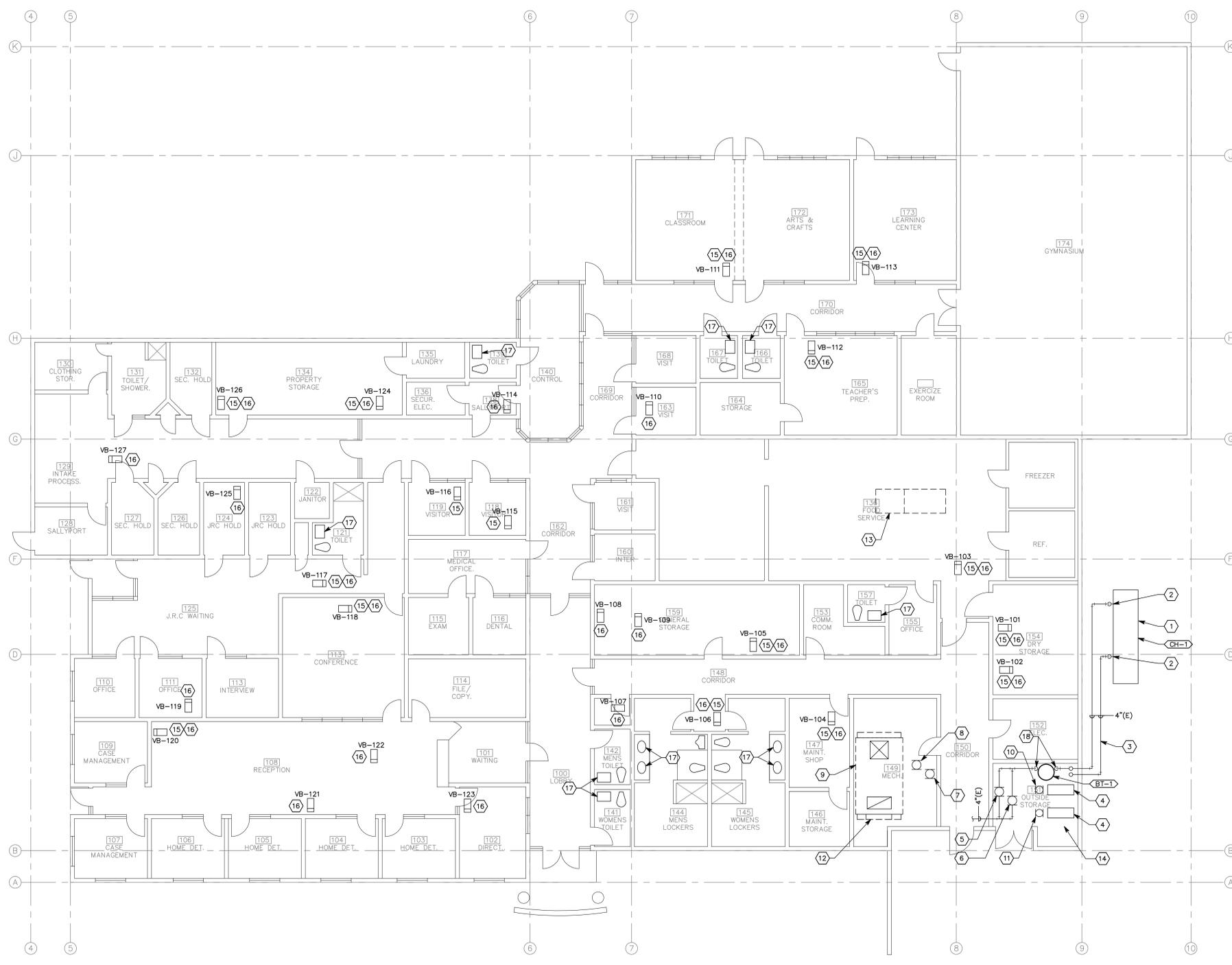
MECHANICAL
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M003

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SHEET KEYNOTES

1. REMOVE EXISTING 50 TON CHILLER.
2. RECONNECT NEW CHILLER TO EXISTING CHILLED WATER PIPING. PROVIDE NEW BUTTERFLY VALVES AND FLEXIBLE CONNECTION.
3. EXISTING BELOW GRADE CHILLED WATER PIPING TO REMAIN.
4. EXISTING BOILER TO REMAIN.
5. EXISTING CHILLED WATER PUMP TO REMAIN. REPLACE EXISTING 2 HP, 460 VOLT, 60 HERTZ, 3 PHASE MOTOR WITH NEW PREMIUM EFFICIENT MOTOR.
6. EXISTING CHILLED WATER EXISTING PUMP TO REMAIN. REPLACE EXISTING 2 HP, 460 VOLT, 60 HERTZ, 3 PHASE MOTOR WITH NEW PREMIUM EFFICIENT MOTOR.
7. EXISTING HOT WATER HEATING PUMP (HWP-2) TO REMAIN. REPLACE EXISTING 5 HP, 460 VOLT, 60 HERTZ, 3 PHASE MOTOR WITH NEW PREMIUM EFFICIENT MOTOR.
8. EXISTING HOT WATER HEATING PUMP (HWP-1) TO REMAIN. REPLACE EXISTING 5 HP, 460 VOLT, 60 HERTZ, 3 PHASE MOTOR WITH NEW PREMIUM EFFICIENT MOTOR.
9. EXISTING VAV AIR HANDLING UNIT (AHU-1) TO REMAIN. REPLACE EXISTING 20 HP, 460 VOLT, 60 HERTZ, 3 PHASE MOTOR WITH NEW PREMIUM EFFICIENT MOTOR.
10. EXISTING BOILER PUMP TO REMAIN. REPLACE EXISTING 1 HP, 460 VOLT, 60 HERTZ, 3 PHASE MOTOR WITH NEW PREMIUM EFFICIENT MOTOR.
11. EXISTING BOILER PUMP TO REMAIN. REPLACE EXISTING 1 HP, 460 VOLT, 60 HERTZ, 3 PHASE MOTOR WITH NEW PREMIUM EFFICIENT MOTOR.
12. PROVIDE ECONOMIZER CONTROL ON RA & OSA DAMPER FOR EXISTING AIR HANDLING UNIT.
13. EXISTING KITCHEN MAKE-UP AIR UNIT TO REMAIN. REPLACE EXISTING 2 HP, 460 VOLT, 60 HERTZ, 3 PHASE MOTOR WITH NEW PREMIUM EFFICIENT MOTOR.
14. PROVIDE NEW 1 1/2" PIPE INSULATION ON ALL INSULATED HOT WATER HEATING PIPE IN BOILER ROOM (APPROXIMATELY 50' LENGTH OF 4" STEEL PIPE).
15. INCLUDE VAV BOX IN NIGHT SETBACK MODE (16 OF 27 VAV BOXES)
16. INTEGRAL EXISTING VAV BOX IN CENTRAL BMS SYSTEM (ALL 27 VAV BOXES).
17. REMOVE EXISTING AERATOR AND PROVIDE NEW CHROMONITE "OMNI" A-200, 0.5 GPM LAMINAR FLOW RESTRICTOR.
18. CONNECT EXISTING CHILLED WATER PIPING TO NEW BUFFER TANK.



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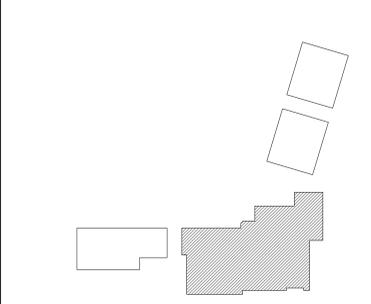


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KEY PLAN



(A2) MECHANICAL PLAN - ADMINISTRATION BUILDING
SCALE: 1/8" = 1'-0"



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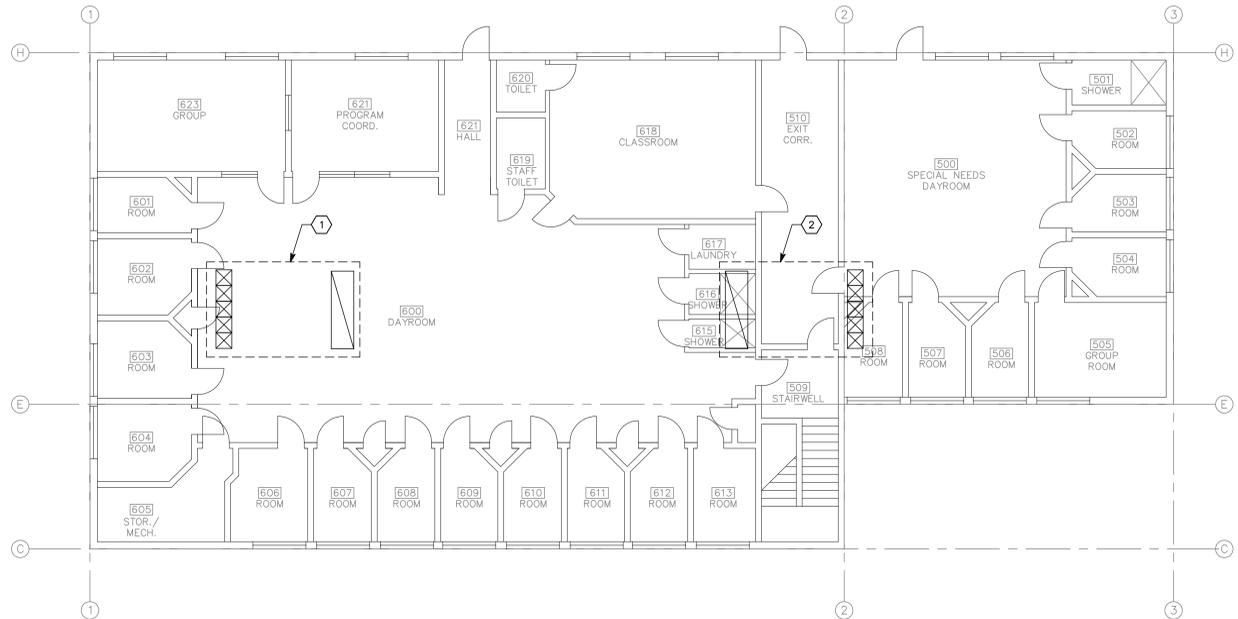
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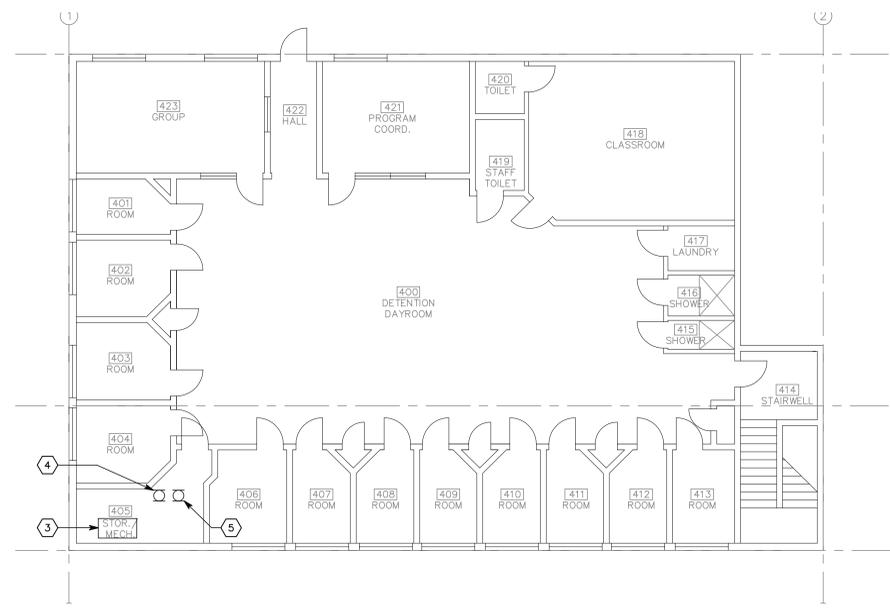
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(C2) DETENTION HOUSING UPPER LEVEL MECHANICAL PLAN
SCALE: 1/8" = 1'-0"



(A2) DETENTION HOUSING LOWER LEVEL MECHANICAL PLAN
SCALE: 1/8" = 1'-0"



SHEET KEYNOTES

1. EXISTING AIR HANDLING UNIT (MZ-1) TO REMAIN. REPLACE EXISTING 20 HP, 460 VOLT, 60 HERTZ, 3 PHASE MOTOR WITH NEW PREMIUM EFFICIENT MOTOR.
2. EXISTING AIR HANDLING UNIT (MZ-3) TO REMAIN. REPLACE EXISTING 15 HP, 460 VOLT, 60 HERTZ, 3 PHASE MOTOR WITH NEW PREMIUM EFFICIENT MOTOR.
3. EXISTING BOILER TO REMAIN.
4. EXISTING HOT WATER HEATING PUMP (HWP-3) TO REMAIN. REPLACE EXISTING 3 HP, 460 VOLT, 60 HERTZ, 3 PHASE MOTOR WITH NEW PREMIUM EFFICIENT MOTOR.
5. EXISTING HOT WATER HEATING PUMP TO REMAIN. REPLACE EXISTING 3 HP, 460 VOLT, 60 HERTZ, 3 PHASE MOTOR WITH NEW PREMIUM EFFICIENT MOTOR.

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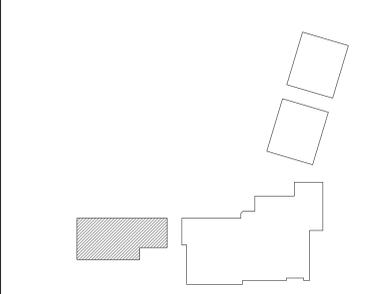


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KEY PLAN



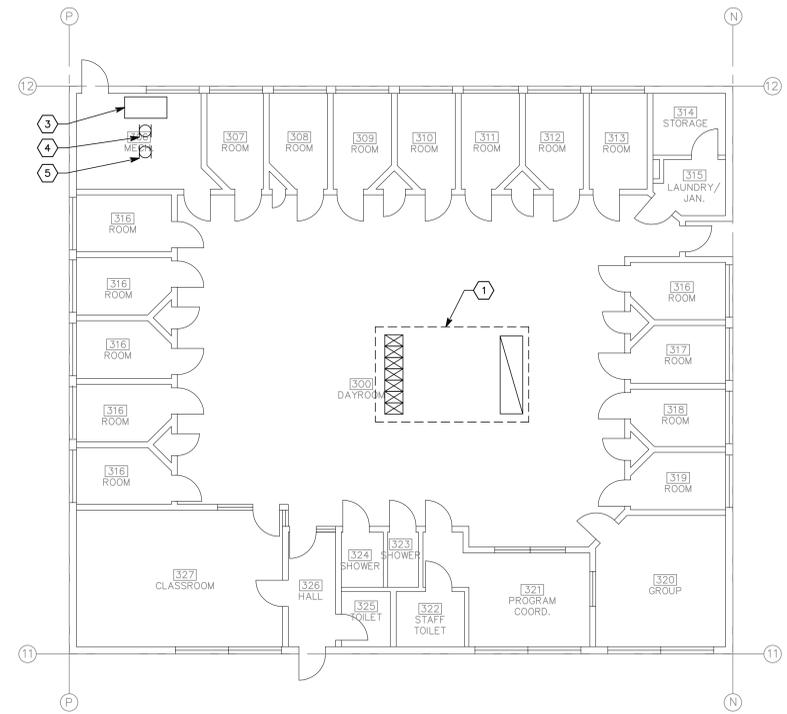
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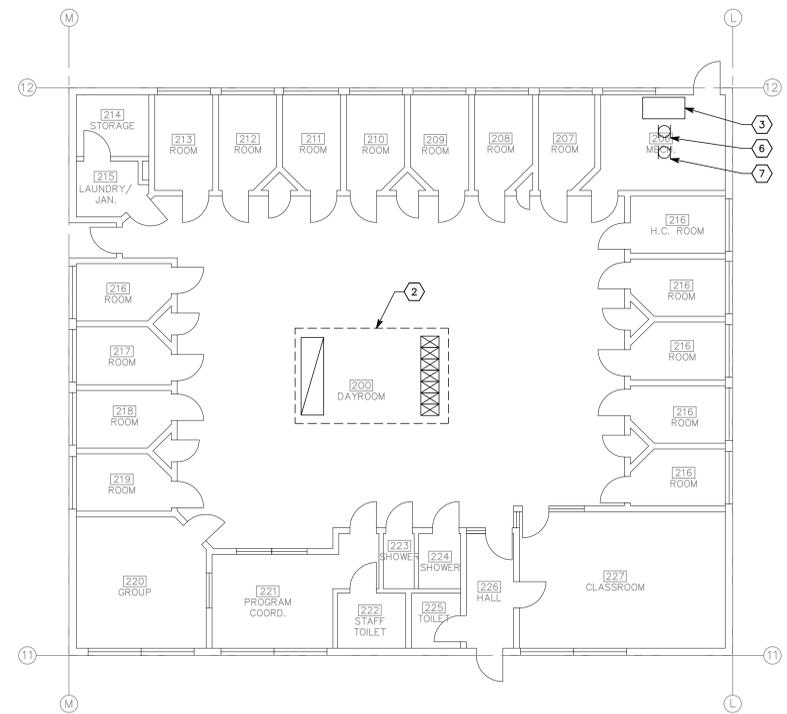
SHEET TITLE
DETENTION HOUSING UPPER & LOWER LEVELS MECHANICAL PLANS

M102

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(C2) LONG TERM HOUSING UNIT B MECHANICAL PLAN
SCALE: 1/8" = 1'-0" NORTH



(A2) LONG TERM HOUSING UNIT A MECHANICAL PLAN
SCALE: 1/8" = 1'-0" NORTH

SHEET KEYNOTES

1. EXISTING AIR HANDLING UNIT (M2-2) TO REMAIN. REPLACE EXISTING 15 HP, 460 VOLT, 60 HERTZ, 3 PHASE MOTOR WITH NEW PREMIUM EFFICIENT MOTOR.
2. EXISTING AIR HANDLING UNIT (M2-2A) TO REMAIN. REPLACE EXISTING 15 HP, 460 VOLT, 60 HERTZ, 3 PHASE MOTOR WITH NEW PREMIUM EFFICIENT MOTOR.
3. EXISTING BOILER TO REMAIN.
4. EXISTING HOT WATER HEATING PUMP (HWP-5) TO REMAIN. REPLACE EXISTING 3 HP, 460 VOLT, 60 HERTZ, 3 PHASE MOTOR WITH NEW PREMIUM EFFICIENT MOTOR.
5. EXISTING HOT WATER HEATING PUMP (HWP-6) TO REMAIN. REPLACE EXISTING 3 HP, 460 VOLT, 60 HERTZ, 3 PHASE MOTOR WITH NEW PREMIUM EFFICIENT MOTOR.
6. EXISTING HOT WATER HEATING PUMP (HWP-6) TO REMAIN. REPLACE EXISTING 3 HP, 460 VOLT, 60 HERTZ, 3 PHASE MOTOR WITH NEW PREMIUM EFFICIENT MOTOR.
7. EXISTING HOT WATER HEATING PUMP (HWP-6) TO REMAIN. REPLACE EXISTING 3 HP, 460 VOLT, 60 HERTZ, 3 PHASE MOTOR WITH NEW PREMIUM EFFICIENT MOTOR.



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LONG TERM HOUSING UNIT A, UNIT B MECHANICAL PLANS

M103

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A

CHILLER SCHEDULE (AIR COOLED)																			
SYMBOL	MANUFACTURER	MODEL NO.	NOMINAL CAPACITY (TONS)	ACTUAL CAPACITY (TONS)	CHILLED WATER								ELECTRICAL					WEIGHT (LBS)	
					FLUID TYPE	FLOW RATE (GPM)	ENT. WATER (F)	LVG. WATER (F)	WATER PRESSURE DROP (FEET)	FULL LOAD EFFICIENCY (EER)	NPLV (EER)	MAXIMUM SOUND POWER LEVELS (DBa)	MINIMUM CIRCUIT AMPACITY (AMPS)	MAXIMUM OVERCURRENT PROTECTION (AMPS)	VOLTS	HERTZ	PHASE		
CH-1	YORK	YCAL096	56.2	56.1	WATER	120	45	55	9.9	9.8	14.4	95	130.3	150	460	60	3	3,300	

ACCEPTABLE MANUFACTURERS:
CARRIER
YORK
TRANE

NOTES:
(1) R-410A REFRIGERANT
(2) 95 F AMBIENT AIR TEMPERATURE
(3) TWO (2) REFRIGERATION CIRCUITS

VALVE SCHEDULE				
SERVICE	VALVE TYPE	PIPE SIZE	DESCRIPTION	BASIS OF DESIGN
CHILLED WATER PIPING	BUTTERFLY VALVE	2-1/2" AND LARGER	DUCTILE IRON BODY, LUG STYLE BODY, EPDM SEAT, ALUMINUM - BRONZE DISK, LEVER OPERATED, MSS SP.67, TYPE I, NSF CERTIFIED, 200 PSI BI-DIRECTIONAL DEAD-END CAPABILITY.	CRANE 44 KITZ 5113
CHILLED WATER PIPING	WYE STRAINER	2-1/2" AND LARGER	ASTM A 126 CLASS B CAST IRON, FLANGED, 125 PSIG CWP, PERFORATED STAINLESS BASKET, 1/16" PERFORATIONS, 40-MESH START-UP STRAINER	WATTS SERIES 77 METRAFLEX M1K
CHILLED WATER PIPING	FLEXIBLE CONNECTION	2-1/2" AND LARGER	DOUBLE SPHERICAL, NYLON REINFORCED NEOPRENE, CLASS 150 STEEL FLANGES, 150 PSIG CWP, 250 F MAX. OPERATING PRESSURE.	METRAFLEX DSNM

CHILLED WATER BUFFER TANK									
SYMBOL	MANUFACTURER	MODEL	LOCATION	SYSTEM	TANK VOLUME (GALLONS)	MAXIMUM TANK DIA. (INCHES)	PIPE CONNECTION (INCHES)	OPERATING WEIGHT (LBS)	COMMENTS
BT-1	LOCHINVAR	CVU200	MECH RM	CHILLED WATER	200	30	84	450	(1) (2) (3) (4) (5) (6)

NOTES:
(1) ASME CONSTRUCTION
(2) R-12 TANK INSULATION WITH UV RESISTANT EXTERIOR
(3) LOWER TANK CONNECTION WITH INTERNAL BAFFLE
(4) 4" X 6" HAND HOLE
(5) AUTOMATIC AIR VENT
(6) TEMPERATURE AND PRESSURE GAUGE

PIPE INSULATION SCHEDULE		
SERVICE	PIPE SIZE	PIPE INSULATION MATERIAL
HOT WATER HEATING CHILLED WATER (BUILDING INTERIOR)	1-1/2" AND SMALLER	1" PREFORMED FIBERGLASS WITH ALL SERVICE JACKET PREFORMED PVC FITTING COVERS
HOT WATER HEATING CHILLED WATER (BUILDING EXTERIOR)	1-1/2" AND SMALLER	1" PREFORMED FIBERGLASS WITH ALL SERVICE JACKET 0.024" CORRUGATED ALUMINUM FIELD APPLIED JACKET
HOT WATER HEATING CHILLED WATER (BUILDING INTERIOR)	2" AND LARGER	1-1/2" PREFORMED FIBERGLASS WITH ALL SERVICE JACKET PREFORMED PVC FITTING COVERS
HOT WATER HEATING CHILLED WATER (BUILDING EXTERIOR)	2" AND LARGER	1-1/2" PREFORMED FIBERGLASS WITH ALL SERVICE JACKET 0.024" CORRUGATED ALUMINUM FIELD APPLIED JACKET



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MECHANICAL
SCHEDULES

M601

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