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MECHANICAL ABBREVIATIONS

Table of mechanical abbreviations including A (Amperes), AC (Air Conditioning), AD (Access Door), AFF (Above Finished Floor), AHU (Air Handling Unit), APPROX (Approximately), AP (Access Panel), ARCH (Architectural), AS (Air Separator), AUTO (Automatic), AUX (Auxiliary), BCS (Building Control System), BHP (Brake Horsepower), BLDG (Building), BOD (Bottom of Duct), BTU (British Thermal Unit), BTUH (British Thermal Units per Hour), CC (Cooling Coil), CD (Condensate Drain), CFM (Cubic Feet per Minute), CH (Chiller), CHR (Chilled Water Return), CHS (Chilled Water Supply), CHWP (Chilled Water Pump), CLG (Ceiling), CMU (Concrete Masonry Unit), CO (Clean-out), COMB (Combination), COMP (Compressor), COND (Condensate or Condenser), CONN (Connection), CONT (Continuation), CU (Condensing Unit), CU FT (Cubic Feet), CUH (Cabinet Unit Heater), CU IN (Cubic Inches), CW (Cold Water (City)), CWP (Condenser Water Pump), CWR (Condenser Water Return), CWS (Condenser Water Supply), D (Drain Line), DB (Dry Bulb), DG (Door Grille), DHW (Domestic Hot Water), DIAM (Diameter), DN (Down), DWG (Drawing), DX (Direct Expansion), EA (Exhaust Air), EAT (Entering Air Temperature), EDB (Entering Dry Bulb Temperature), EDH (Electric Duct Heater), EF (Exhaust Fan), EH (Electric Heater), EL (Elevation), ELEC (Electrical), EQ (Equal), ET (Expansion Tank), EVAP (Evaporator), EWB (Entering Wet Bulb Temperature), EWT (Entering Water Temperature), EXIST (Existing), EXP (Expansion), F (Fire Sprinkler Piping), F (Degrees Fahrenheit), FA (Free Area (Sq. Ft.) or Face Area), FBP (Field Built Plenum), FCO (Floor Cleanout), FCU (Fan Coil Unit), FD (Floor Drain), FDPR (Fire Damper), FLA (Full Load Amperes), FLEX (Flexible), FPI (Fins per Inch), FPM (Feet per Minute), FPS (Feet per Second), FTB (Fan Powered Terminal Box), FV (Face Velocity), GA (Gauge), GAL (Gallons), GPH (Gallons per Hour), GPM (Gallons per Minute), HB (Hose Bibb), H2O (Water), HC (Heating Coil), HD (Head), HORIZ (Horizontal), HP (Horsepower or Heat Pump), HW (Hot Water), HR (Hour), HT (Height), HZ (Frequency (Hertz)), ID (Inside Diameter), IN (Inch or Inches), INSUL (Insulation), KW (Kilowatt), LAT (Leaving Air Temperature), LB/HR (Pounds per Hour), LBS (Pounds), LDB (Leaving Dry Bulb Temperature), LIN FT (Linear Feet), LWB (Leaving Wet Bulb), LWT (Leaving Water Temperature), MAX (Maximum), MB (Mixing Box), MBH (BTU, Thousands), MC (Mechanical Contractor), MIN (Minimum), NC (Normally Closed), NIC (Not in Contract), NO (Normally Open), NO. (Number), NTS (Not to Scale), OA (Outside Air), OD (Outside Diameter), OV (Outlet Velocity), MCA (Maximum Circuit Amps), MOC (Maximum Overcurrent Protection), LRA (Lock Rotor Amps), RLA (Rated Load Amps), PC (Plumbing Contractor), PCHWP (Primary Chilled Water Pump), PD (Pressure Drop), PHC (Preheat Coil), PSI (Pounds per Square Inch), PSIA (Psi Absolute), PSIG (Psi Gauge), PRESS (Pressure), PVC (Polyvinyl Chloride), RA (Return Air), RAF (Return Air Fan), REQD (Required), RF (Relief Fan), RH (Relative Humidity), RHC (Reheat Coil), RHG (Refrigerant Hot Gas Discharge), RLL (Refrigerant Liquid Line), RM (Room), RPM (Revolutions per Minute), RSL (Refrigerant Suction Line), RV (Relief Valve), S/FDPR (Combined Smoke and Fire Damper), SA (Supply Air), SAF (Supply Air Fan), SAN (Sanitary), SAU (Sound Attenuation Unit), SCHWP (Secondary Chilled Water Pump), SGCHS (Secondary Glycol Chilled Water Supply), SGCHR (Secondary Glycol Chilled Water Return), SDPR (Smoke Damper), SP (Static Pressure), SPEC (Specification), TAO (Transfer Air Opening), TD (Trench Drain), TDH (Total Dynamic Head), TEMP (Temperature), TS (Tip Speed), TYP (Typical), UG (Underground), UH (Unit Heater), VAV (Variable Air Volume Unit), VD (Volume Damper), W (Watt), W (With), W/O (Without), WB (Wet Bulb), WC (Water Column), WCO (Wall Cleanout), WG (Water Gauge), WP (Working Pressure), WMS (Wire Mesh Screen), ZD (Zone Damper)

GENERAL LEGEND

General Legend symbols and definitions including Pipe Section-Supply, Pipe Section-Return, Direction of Flow in Pipe, Pitch Pipe Down, Pipe Up, Pipe Down, Pipe Anchor, Pipe Guide, Expansion Joint, Flexible Pipe Connector, Ball Valve, Check Valve, Gate Valve, Globe Valve, Balancing Cock, Butterfly Valve, Strainer, Strainer/Shut-off Valve, Automatic Control Valve, Needle Valve, Manual Air Vent, Automatic Air Vent, Temperature & Pressure Tap, Pressure Gauge, Solenoid Valve, Capped Line, Chilled Water Supply, Chilled Water Return, Chemical Feed Piping, Condensate Drain, Condenser Water Supply, Condenser Water Return, Volume Damper, Point of Disconnection, Point of Connection, Pipe Reduction, Thermometer, Thermometer Well, Round Duct, Flat Oval Duct, Sidewall Supply, Sidewall Return, Ceiling Diffuser Supply, Ceiling Return, Floor Supply, Floor Return, Return Linear, Continuous 2-Slot, Door Undercut, Delta T, Round Duct Section-Supply, Round Duct Section-Return, Duct Section-Supply, Duct Section-Return, Flexible Duct Connection, Fire Damper & Access Door, Volume Damper, Turning Vanes, Smoke Damper & Access Door, Flexible Round Duct, Section Designation, Sheet Where Section Appears, Sheet Where Section Cut, Thermostat, Smoke Detector, Down Duct Static Pressure Sensor, Indoor Air Quality Sensor, Motorized Valve, Remote Temperature Sensor, Humidistat, Motorized Damper, Air Flow Measuring Station, Flow Meter.

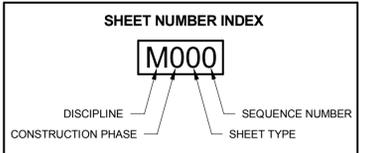
GENERAL NOTES

- REFER TO THE DIVISION 23 SPECIFICATIONS.
1. THE CONTRACTOR SHALL DEMONSTRATE EACH HVAC SYSTEMS PERFORMANCE IN THE PRESENCE OF THE ENGINEER AND THE OWNER'S PROJECT MANAGER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COST OF ANY ADDITIONAL SYSTEM TEST REQUIRED IF IN THE OPINION OF THE ENGINEER AND THE OWNER'S PROJECT MANAGER THE SYSTEMS DO NOT PERFORM AS SPECIFIED.
2. VISIT AND CAREFULLY EXAMINE THOSE PORTIONS OF THE BUILDING AND SITE AFFECTED BY THIS WORK BEFORE SUBMITTING PROPOSALS, SO AS TO BECOME FAMILIAR WITH EXISTING CONDITIONS AND DIFFICULTIES THAT WILL AFFECT EXECUTION OF THE WORK. SUBMISSION OF A PROPOSAL WILL BE CONSTRUED AS EVIDENCE THAT SUCH EXAMINATION HAS BEEN MADE AND LATER CLAIMS FOR LABOR, EQUIPMENT OR MATERIALS REQUIRED BECAUSE OF DIFFICULTIES ENCOUNTERED WILL NOT BE RECOGNIZED.
3. ALL AIR HANDLING UNITS SHALL UTILIZE A FULLY DUCTED RETURN AIR SYSTEM.
4. ALL GRILLES, REGISTERS OR DIFFUSERS SHOWN IN THE CEILING SHALL BE 24x24 UNLESS OTHERWISE NOTED.
5. PROVIDE A DUCT ACCESS DOOR FOR ALL S/FDPR, SDPR AND/OR FDPR SHOWN ON CONSTRUCTION DOCUMENTS. ACCESS DOORS MAY NOT BE SHOWN FOR CLARITY OF THE DOCUMENTS.
6. PROVIDE A VOLUME DAMPER AT EVERY BRANCH DUCT AND AS SHOWN ON THE DOCUMENTS FOR ALL DUCTWORK SYSTEMS. ALL DAMPERS MAY NOT BE SHOWN ON THE DOCUMENTS FOR CLARITY.
7. ALL VOLUME DAMPERS INSTALLED ABOVE GYPSUM BOARD CEILING SHALL HAVE A REMOTELY OPERATED DAMPER. FIELD VERIFY LOCATION OF DEVICE.
8. VERIFY EXACT LOCATION OF ALL ELECTRICAL EQUIPMENT INCLUDING WALL SWITCHES, FIRE ALARM DEVICES, ETC. WITH ELECTRICAL CONTRACTOR AND ELECTRICAL DRAWINGS.
9. ALL OUTSIDE AIR INTAKES SHALL HAVE A REMOVABLE AND CLEANABLE BIRD SCREEN.
10. INSTALL A SMOKE DETECTOR IN THE SUPPLY AND RETURN DUCTWORK AS SHOWN. DETECTOR SHALL DE-ENERGIZE THE SUPPLY FAN WHEN SMOKE IS DETECTED. CONNECT TO THE FIRE ALARM SYSTEM, SO THAT THE ALARM ENUNCIATED AT THE FIRE ALARM PANEL CORRESPONDS TO THE AREA IN ALARM.
11. ALL DUCT SIZES INDICATED ON THE DOCUMENTS ARE NET FREE AREA DIMENSIONS.
12. UNFORESEEN CONDITIONS MAY EXIST AND WORK MAY NOT BE FIELD LOCATED EXACTLY AS SHOWN ON THE DRAWINGS. COOPERATION WITH OTHER TRADES IN ROUTING AS DETERMINED DURING CONSTRUCTION AND AS DIRECTED BY THE ARCHITECT/ENGINEER MAY BE NECESSARY. IT IS INTENDED THAT SUCH DEVIATIONS SHALL BE CONSIDERED AS PART OF THIS CONTRACT. SUCH DEVIATIONS MAY NOT BE CONSIDERED AS PART OF THIS CONTRACT WHEN PROPERLY DOCUMENTED IN WRITING. THE PLANS ARE NOT COMPLETELY TO SCALE. THIS CONTRACTOR IS TO FIELD VERIFY DIMENSIONS OF ALL SITE UTILITIES, ETC. PRIOR TO BID AND INCLUDE ANY DEVIATIONS IN THE CONTRACT.
13. ALL PIPING AND DUCT IS TO BE CONCEALED ABOVE CEILING OR IN NEW WALLS, UNLESS SPECIFICALLY NOTED AS EXPOSED OR SURFACE MOUNTED.
14. WORK SHALL BE PERFORMED, IN STRICT COMPLIANCE WITH THE ESTABLISHED WORK SCHEDULE BEING SET FORTH BY THE OWNER. COORDINATE ALL WORK WITH GENERAL CONTRACTOR. THIS CONTRACTOR SHALL FURNISH ADEQUATE FORCES, CONSTRUCTION PLANT AND EQUIPMENT, AND SHALL WORK SUCH HOURS, INCLUDING NIGHT SHIFTS, OVERTIME OPERATIONS, SUNDAYS AND HOLIDAYS IN ACCORDANCE WITH THE OWNER'S SCHEDULE AS LISTED IN DIVISION 1 OF THE SPECIFICATIONS. IF THE CONTRACTOR DOES NOT MAINTAIN THE CONSTRUCTION SCHEDULE BECAUSE OF INADEQUATE FORCES, SUPERVISION OR ANY OTHER REASON UNDER THE CONTRACTOR'S CONTROL, THE OWNER MAY REQUIRE THE CONTRACTOR TO INCREASE THE NUMBER OF SHIFTS AND/OR OVERTIME OPERATIONS, DAY OF WORK AND/OR THE AMOUNT OF CONSTRUCTION PLANT, AT NO ADDITIONAL COST TO THE OWNER UNDER THIS CONTRACT. FAILURE TO MAINTAIN THE CONSTRUCTION SCHEDULE DUE TO OWNER'S OPERATIONAL INTERFERENCES, WHICH WERE NOT IDENTIFIED IN OR PRIOR TO THE PRE-BID CONFERENCE, SHALL NOT BE THE CONTRACTOR'S LIABILITY.
15. ALL CONCRETE, WALL PATCHING, CEILING REPAIR, FENCE WORK AND OTHER GENERAL CONSTRUCTION WORK REQUIRED FOR INSTALLING MECHANICAL/PLUMBING OR FIRE PROTECTION SYSTEMS SHALL BE PROVIDED BY MECHANICAL CONTRACTOR AND FULLY COORDINATED WITH GENERAL CONTRACTOR USING THE APPROPRIATE CONSTRUCTION TRADES.
16. ALL MATERIALS AND EQUIPMENT SHALL BE NEW AND SHALL BE UL LISTED WHERE APPLICABLE.
17. DUCTWORK SHALL NOT BE SUPPORTED BY THE CEILING SUSPENSION SYSTEM. COORDINATE LOCATIONS OF GRILLES, DIFFUSERS AND LOUVERS WITH ELECTRICAL, ARCHITECTURAL AND PLUMBING WORK.
18. THE ROOF DECK SHALL NOT SUPPORT DUCTWORK, PIPING, EQUIPMENT OR ANY OTHER DEVICES. ALL SUPPORTS SHALL BE SPAN BETWEEN THE STRUCTURAL BEAMS TO SUPPORT THE MECHANICAL EQUIPMENT. PENETRATION OF THE ROOF DECK WILL NOT BE ACCEPTED.
19. IN GENERAL, PLANS AND DIAGRAMS ARE SCHEMATIC ONLY AND SHOULD NOT BE SCALED. CONTRACTOR SHALL COORDINATE ALL PLUMBING, HEATING AND ELECTRICAL WORK AT THE SITE, SO AS NOT TO CONFLICT IN LOCATION WITH OTHER WORK UNDER THE CONTRACT. ALL PIPING SHOWN ON A SITE PLAN SHALL BE VERIFIED AND COORDINATED WITH THE CIVIL DOCUMENTS PRIOR TO THE BID.
20. ANY CONFLICT WITH DOORS, WINDOWS, CABINETS OR ANY OTHER EQUIPMENT SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT/ENGINEER.
21. THE MECHANICAL CONTRACTOR IS DIRECTED TO COMPLY WITH DIVISION 26 OF THE CONTRACT SPECIFICATIONS REFERRING TO MOTORS, STARTERS, ETC.
22. ALL DOOR GRILLES, OUTSIDE AIR LOUVERS, DISCHARGE LOUVERS, SHOWN ON THE MECHANICAL DRAWINGS, SHALL BE FURNISHED AND INSTALLED BY THE MECHANICAL CONTRACTOR. THE SIZE AND LOCATION OF EQUIPMENT INSTALLED UNDER DIVISION 23 - MECHANICAL SHALL BE COORDINATED WITH OTHER TRADES. THE MECHANICAL CONTRACTOR SHALL VERIFY ALL COLORS AND FINISHES OF THESE DEVICES, WITH THE ARCHITECT, PRIOR TO ORDERING OF THE EQUIPMENT.
23. WHENEVER A REFERENCE IS MADE TO STANDARD, INSTALLATION AND MATERIALS SHALL COMPLY WITH THE LATEST PUBLISHED EDITION AT THE TIME THE PROJECT IS BID UNLESS OTHERWISE SPECIFIED.
24. ALL MATERIAL STORED ON SITE SHALL BE PROPERLY PROTECTED FROM INJURY OR DETERIORATION. MATERIAL SHALL NOT BE STORED IN CONTACT WITH THE GROUND OR FLOOR. ALL DUCTWORK AND EQUIPMENT STORED SHALL BE SEALED AT ANY OPENING TO PREVENT ANY DEBRIS OR DIRT ENTERING THE INSIDE OF THE DUCTWORK AND EQUIPMENT. IF DEBRIS OR DIRT IS FOUND INSIDE THE DUCTWORK DURING ANY INSPECTION, THE CONTRACTOR WILL BE RESPONSIBLE FOR ALL COSTS INCURRED TO CLEAN THE DUCTWORK TO THE SATISFACTION OF THE OWNER AND ENGINEER.

- 26. VOLUME DAMPERS SHALL BE INSTALLED IN ALL BRANCH DUCTS LEADING FROM MAIN TRUNK LINES. ALL EXTERNAL FIBROUS GLASS WRAPPED INSULATION JOINTS, SEAMS AND CONNECTIONS SHALL BE CONSTRUCTED WITH FAB AND STAPLES AND THEN SEALED WITH MASTIC. HEAT AND PRESSURE SENSITIVE TAPE ARE NOT ACCEPTABLE AS A FINAL CLOSURE.
27. PROVIDE FIRE DAMPERS AT EACH FIRE RATED WALL PENETRATION OF ALL AIR SUPPLY, RETURN, EXHAUST AND VENTILATION DUCTS. IF NOT SHOWN ON THE DOCUMENTS THIS MUST BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO BID. ACCESS DOORS IN WALLS, CEILING AND DUCTS SHALL BE PROVIDED FOR INSPECTION OF ALL FIRE, SMOKE AND FIRE/SMOKE DAMPERS. ACCESS DOORS SHALL BE OF A SIZE ADEQUATE FOR THE PURPOSE AND SHALL MAINTAIN ANY NECESSARY FIRE RATINGS AS TESTED IN ACCORDANCE WITH NFPA 90A REQUIREMENTS AND SHALL HAVE COMPOSITE FIRE AND SMOKE HAZARD RATING AS TESTED IN ACCORDANCE WITH NFPA 225 OR UL 723 NOT EXCEEDING FLAME SPREAD OF MORE THAN 25 AND SMOKE DEVELOPED 50. REFER TO SPECIFICATIONS.
29. ALL DUCTWORK AND PIPING SHALL TRANSITION UP INTO JOIST SPACE TO GIVE MAXIMUM CLEARANCES TO CEILING AND LIGHTING DEVICES.
30. ALL WORK SHALL BE INSTALLED IN ACCORDANCE WITH THE FLORIDA BUILDING CODE 5TH EDITION (2014), FLORIDA BUILDING CODE 5TH EDITION (2014) PLUMBING, FLORIDA BUILDING CODE 5TH EDITION (2014) MECHANICAL, FLORIDA FIRE PREVENTION CODE 5TH EDITION (2014), FLORIDA BUILDING CODE 5TH EDITION (2014) ENERGY CONSERVATION & STANDARDS AS REFERENCED IN DIVISION 1 AND THROUGHOUT THE SPECIFICATIONS.
31. ALL MULTIPLE COOLING OR HEATING COILS SHALL HAVE SEPARATE VALVE PACKAGES FOR EACH COIL. ALL AIR HANDLING SYSTEMS SHALL BE PROVIDED WITH ZONE HUMIDISTATS OR COMBINATION THERMOSTATS/HUMIDISTATS. UNIT CONTROLS, WHETHER PACKAGED WITH THE UNIT OR VIA A CENTRAL AUTOMATION SYSTEM, SHALL BE CONFIGURED TO CONTROL ZONE HUMIDITY BY ACTIVATION OF UNIT HOT GAS REHEAT AND/OR ELECTRIC HEATING COIL. WHEN ELECTRIC HEATING COILS ARE USED THE MINIMUM RH SETPOINT SHALL BE NOT LESS THAN 60% RH. IN THE EVENT THAT ADEQUATE SEQUENCES OR HUMIDITY CONTROL EQUIPMENT ARE NOT INDICATED ON THE CONTRACT DOCUMENTS THE CONTRACTOR SHALL NOTIFY THE ENGINEER TO ISSUE REQUIRED DOCUMENTS. INCLUSION OF ACTIVE HUMIDITY CONTROL SHALL BE FURNISHED AND INSTALL WITH NO ADDITIONAL INCREASE IN CONTRACT PRICE.
37. THE CONTROL CONTRACTOR MUST VERIFY AND RESELECT THE "OV" RATINGS AND SIZES OF THE CONTROL VALVES PRIOR TO INSTALLATION. THE PRESSURE DROP THROUGH THE CONTROL VALVE SHALL BE BETWEEN 4-5 POUNDS OF PRESSURE DROP. THE CONTRACTOR SHALL FULLY COMPLY WITH THE ENGINEER TO REVIEW.
38. THE MECHANICAL CONTRACTOR SHALL PROVIDE A LOG OF ALL MECHANICAL EQUIPMENT THAT HAS BEEN REPAIRED OR REPLACED PRIOR TO SUBSTANTIAL COMPLETION TO THE ENGINEER TO REVIEW.
40. THE CONTRACTOR SHALL FULLY COMPLY WITH THE FBC 2010 SECTION 1616.2 FOR SLEEVING PIPES THROUGH A SLAB-ON-GRADE CONCRETE SLAB.
41. CONTRACTOR IS TO ENSURE THAT ALL MOTORS, STARTERS, DISCONNECTS AND VFD'S ARE WIRED EVEN IF NOT SHOWN ON DRAWINGS.

PROJECT DESIGN CONDITIONS table with columns for TEMPERATURE CONDITIONS (OUTDOOR, INDOOR), BUILDING LOAD CONDITIONS (INTERNAL LOADS, EXTERNAL LOADS), QUANTITY, UNITS, COMMENTS.

MECHANICAL SHEET LIST table with columns SHEET NUMBER, SHEET NAME, listing sheets M001 through M902.



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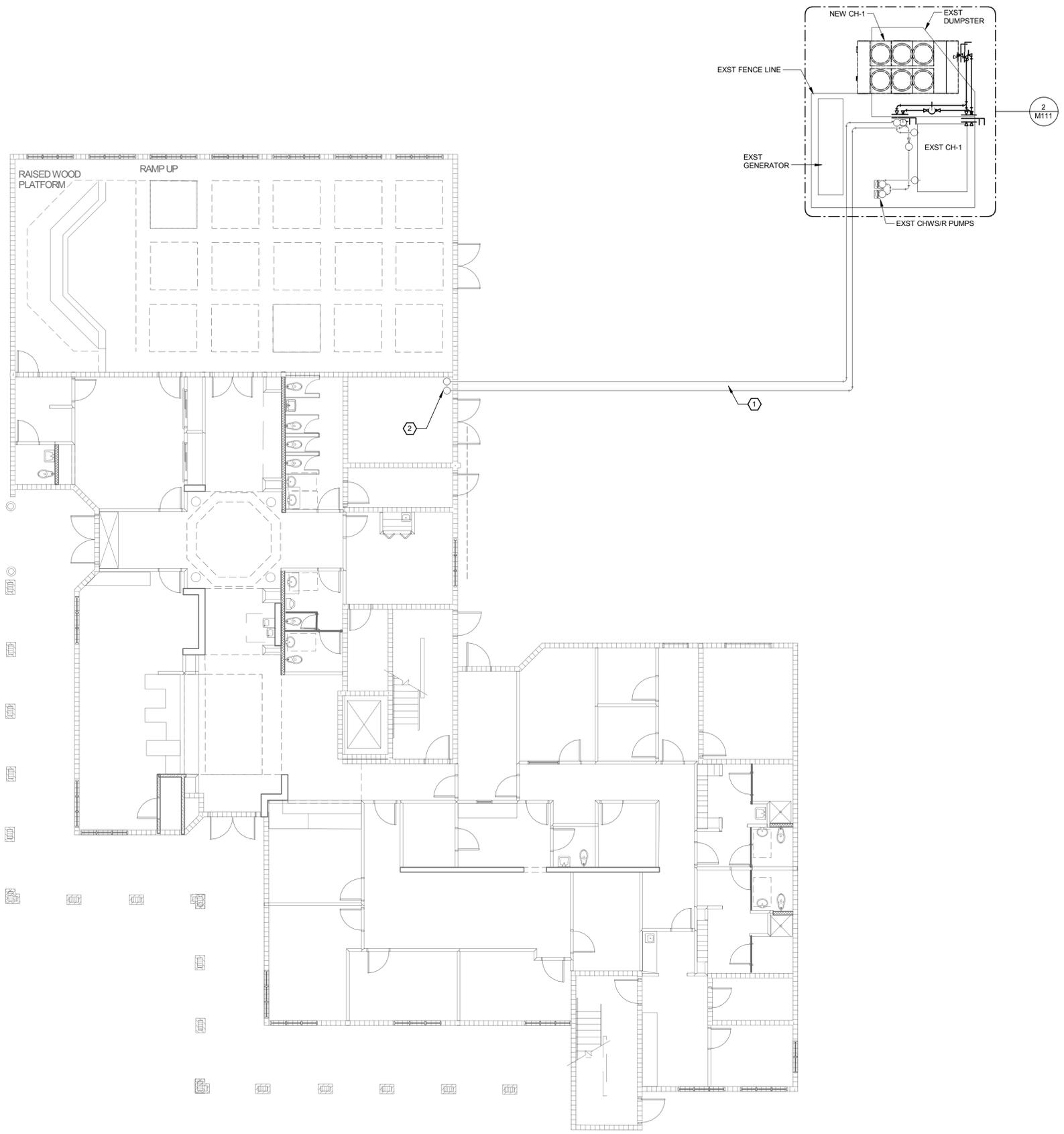
CITY HALL HVAC UPGRADE CITY OF TAVARES 201 E. MAIN STREET TAVARES, FLORIDA, 32778

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GENERAL NOTES:

- REFER TO GENERAL NOTES FOR THIS DISCIPLINE.
- REFER TO SPECIFICATIONS.
- ALL HEX NOTES NOT NECESSARILY USED ON ALL SHEETS.

HEX NOTES:

- EXISTING 3" UNDERGROUND CHWS/R.
- EXISTING 3" FROM UNDERGROUND CHWS/R INTO MECHANICAL ROOM.

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① PHASE I - SITE PLAN - MECHANICAL
1/8" = 1'-0"



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PHASE I - SITE PLAN - MECHANICAL
M101
 ISSUE DATE 10/26/16

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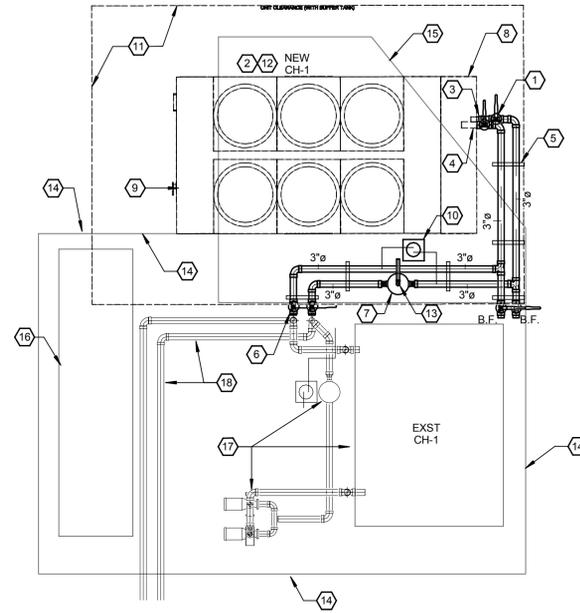
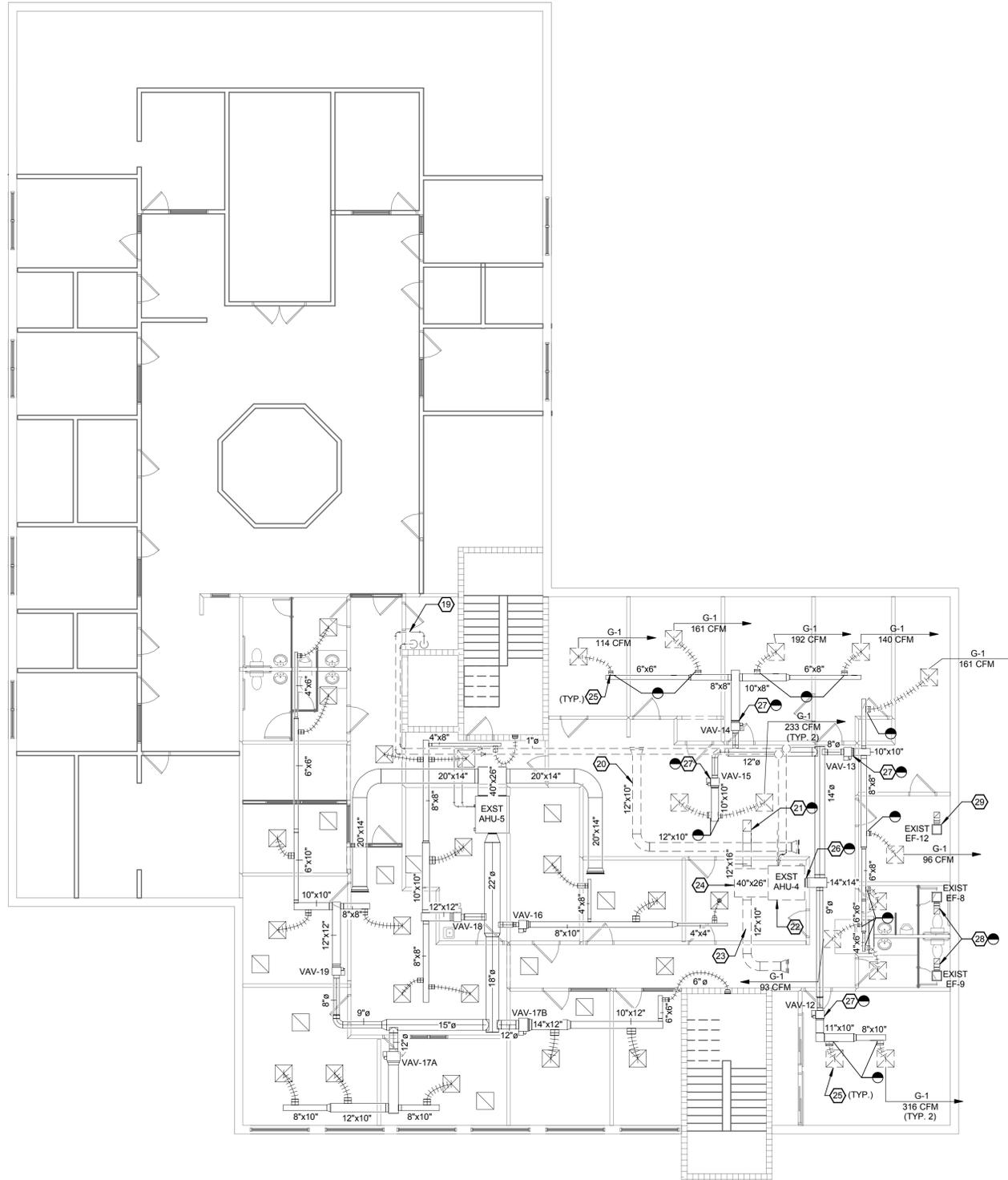
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- GENERAL NOTES:
- REFER TO GENERAL NOTES FOR THIS DISCIPLINE.
 - REFER TO SPECIFICATIONS.
 - ALL EXPOSED PIPE AND CHS/R ACCESSORIES TO HAVE ALUMINUM JACKET AND LABELED. REFER TO SPECIFICATIONS.
 - REFER TO CHILLED WATER SCHEMATIC FOR MORE INFORMATION.

- HEX NOTES:
- TYPICAL BUTTERFLY VAVLE.
 - CH-1 TO HAVE 8" BASERAILS, NEOPRENE ISOLATION PADS, AND INSTALLED ON A SLAB ON GRADE.
 - 2.5" CHR CONNECTION TO CHILLER INLET. PROVIDE REDUCER FROM 3" LINE.
 - 3" CHS CONNECTION TO CHILLER OUTLET.
 - TYPICAL DIAGRAMMATIC PIPE SUPPORT. REFER TO SPECIFICATIONS FOR EXACT REQUIREMENTS.
 - 3" CHS/R LINES WITH ISOLATION VALVES ARE TO BE ROUTED AS SHOWN AND TERMINATE BEFORE THE EXISTING CHWS/R UNDERGROUND PIPING RISER. THE CONNECTION TO THE EXISTING UNDERGROUND PIPING RISER WILL BE COMPLETED IN PHASE II. REFER TO SHEET M211 FOR FUTURE CONNECTION.
 - AIR SEPERATOR, AS-1. CONNECTIONS ARE 3" FOR INLET AND OUTLET.
 - CEP IS TO BE LOCATED BEHIND A CHAIN-LINK FENCE WHICH IS TO BE INSTALLED IN PHASE II. REFER TO SHEET M221.
 - ELECTRICAL POWER CONNECTION FOR THE CHILLER. SINGLE POINT.
 - CHEMICAL FILTER FEEDER ON A 4" HOUSEKEEPING PAD.
 - AIR COOLED CHILLER SERVICE AREAS. TYPICAL ALL PROVIDE FACTORY MOUNTED VFD'S & CHS/R PUMPS UNDER CONDENSER FANS.
 - 1-1/2" CW MAKE-UP TO PRIMARY LOOP WITH A DIGITAL METER CONNECTED TO THE BCS, PRV AND BACKFLOW PREVENTER PROVIDED BY MECHANICAL CONTRACTOR.
 - ALL EXISTING CHAIN-LINK FENCING TO BE REMOVED TO ALLOW THE INSTALLATION OF THE NEW CHILLER.
 - REMOVAL AND RELOCATION OF DUMPSTER AND ENCLOSURE WILL BE DONE PRIOR TO CONSTRUCTION BY OWNER.
 - EXISTING GENERATOR TO REMAIN OPERATIONAL DURING CONSTRUCTION.
 - EXISTING CHILLER AND ALL ASSOCIATED EQUIPMENT PIPING AND ACCESSORIES ARE TO REMAIN OPERATIONAL DURING PHASE I OF CONSTRUCTION.
 - EXISTING 3" UNDERGROUND PIPING TO REMAIN.
 - REMOVE EXISTING 1-1/2" CHWS/R PIPING FROM REDUCER TO END OF RUN AS SHOWN.
 - REMOVE EXISTING TRANSFER DUCTWORK IN ITS ENTIRETY.
 - REMOVE EXISTING OUTSIDE AIR DUCTWORK FROM INTAKE ON ROOF.
 - REMOVE EXISTING AIR HANDLING UNIT IN CEILING AND ALL ASSOCIATED PIPING AND ACCESSORIES.
 - REMOVE EXISTING RETURN DUCTWORK AND RETURN GRILLE.
 - REMOVE EXISTING RETURN DUCTWORK PLENUM BOX.
 - REMOVE BRANCH DUCVORK AS SHOWN AND ASSOCIATED SUPPLY DIFFUSER.
 - REMOVE AND DISCONNECT SUPPLY DUCTWORK CONNECTION TO EXISTING AHU.
 - REMOVE EXISTING VAV BOX AND ALL ASSOCIATED CONTROLS. NEW VAV BOX TO BE INSTALLED. REFER TO SHEET M211.
 - REMOVE EXISTING EXHAUST FAN AND ALL ASSOCIATED DUCTWORK UP TO GOOSENECK ON ROOF. PATCH AND REPAIR CEILING TO MATCH EXISTING.
 - REMOVE EXISTING FAN ON ROOF. OPENING AND EXISTING ROOF CURB IS TO REMAIN. REFER TO SHEET M211.

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PHASE I - FLOOR PLAN - MECHANICAL
M111

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① PHASE I - SECOND FLOOR PLAN - MECHANICAL
 1/8" = 1'-0"

② PHASE I - ENLARGED PLAN - CHILLER YARD
 1/4" = 1'-0"

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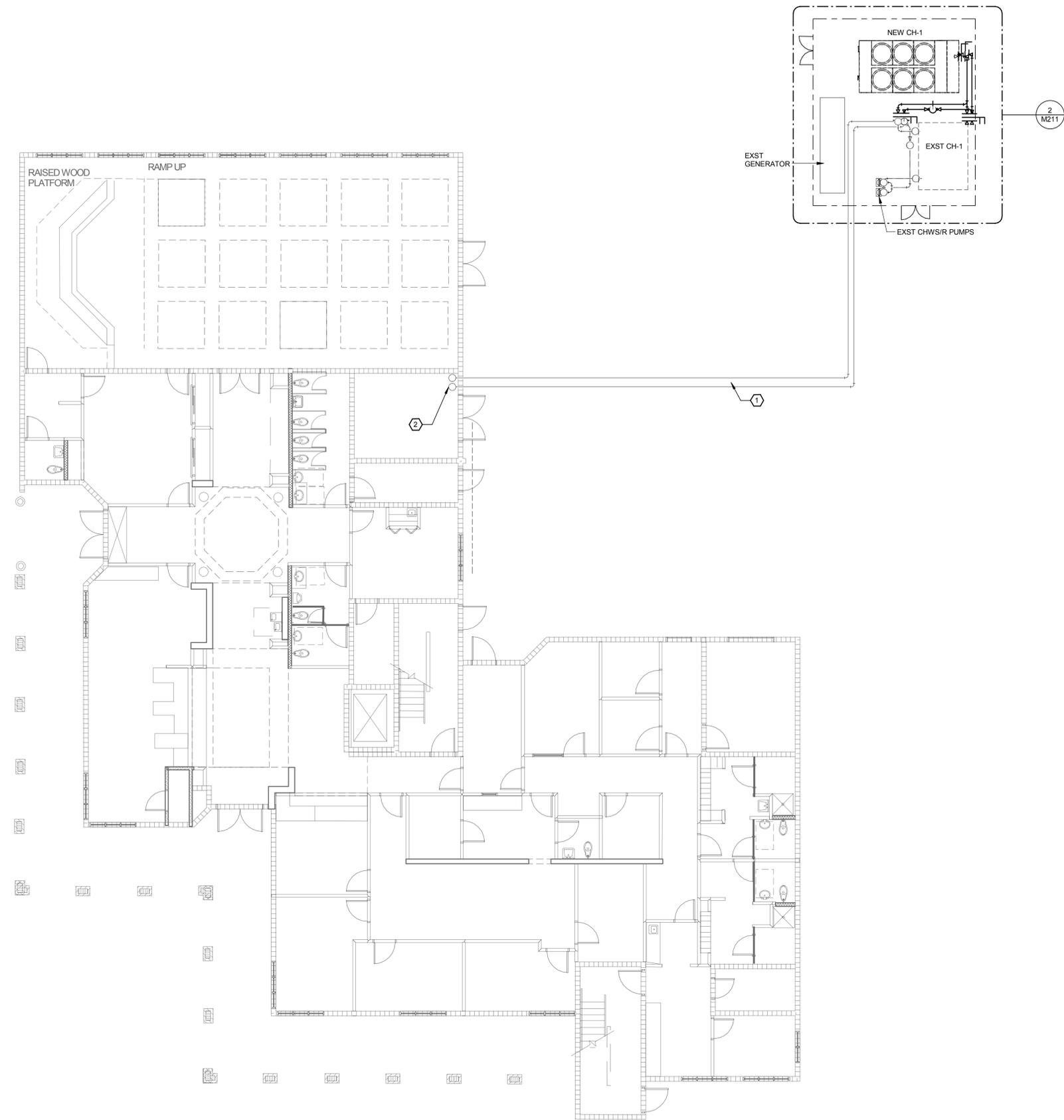
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GENERAL NOTES:

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2. REFER TO SPECIFICATIONS.
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HEX NOTES:

1. EXISTING 3" UNDERGROUND CHWS/R.
2. EXISTING 3" FROM UNDERGROUND CHWS/R INTO MECHANICAL ROOM.

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PHASE II - SITE PLAN - MECHANICAL
M201
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1 PHASE II - SITE PLAN - MECHANICAL
 1/8" = 1'-0"

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MPE JOB #. 2016-166

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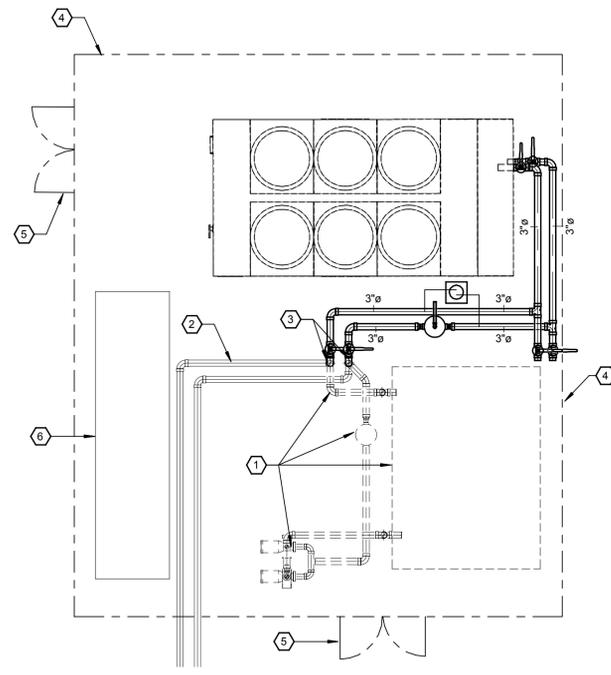
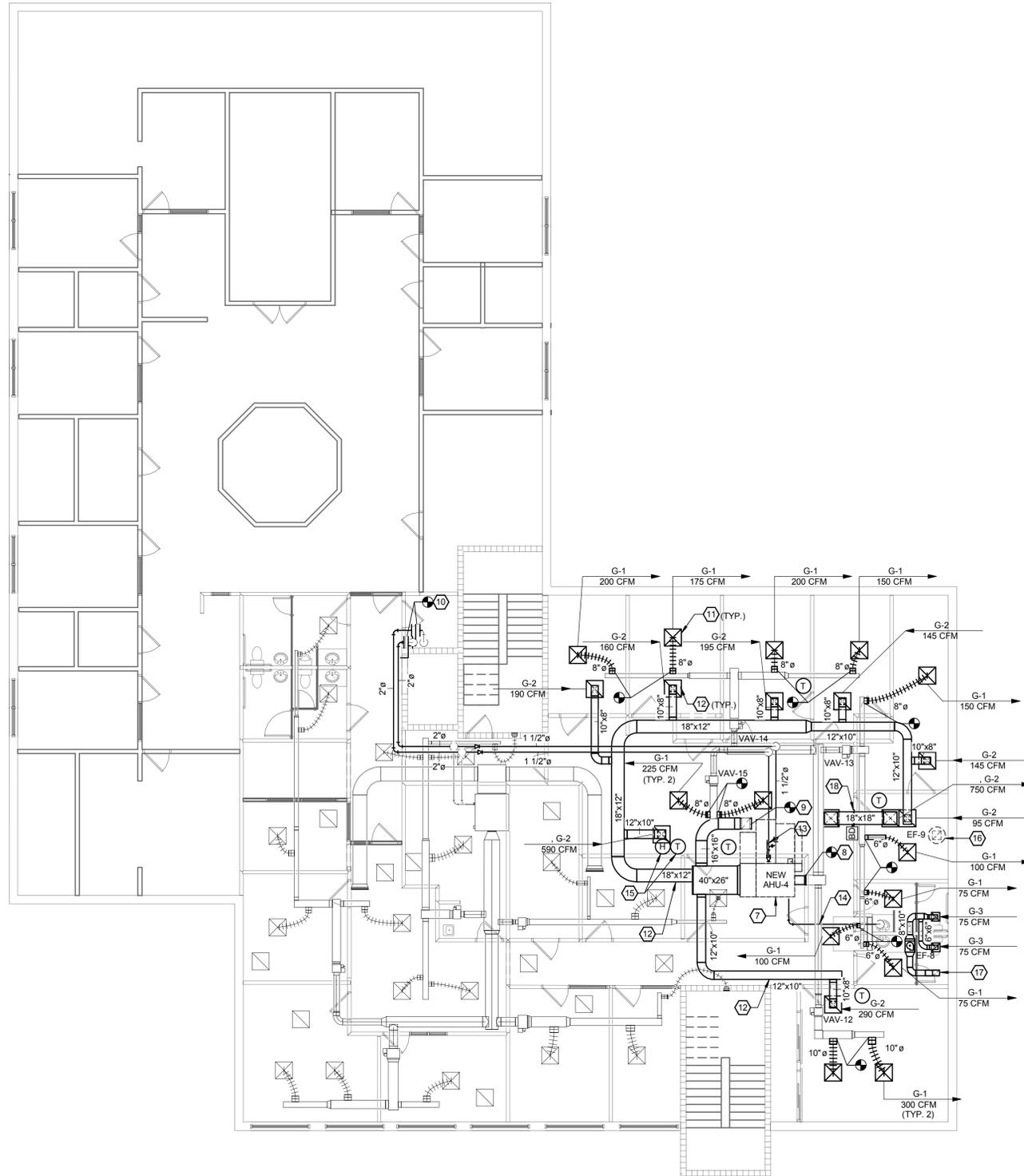
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C

B

A



- GENERAL NOTES:
- REFER TO GENERAL NOTES FOR THIS DISCIPLINE.
 - REFER TO SPECIFICATIONS.
 - ALL EXPOSED PIPE AND CHWS/R ACCESSORIES TO HAVE ALUMINUM JACKET AND LABELED. REFER TO SPECIFICATIONS.
 - REFER TO CHILLED WATER SCHEMATIC FOR MORE INFORMATION.

- HEX NOTES:
- EXISTING CH-1 TO BE REMOVED WITH ALL ASSOCIATED ABOVE GROUND PIPING, EQUIPMENT AND ACCESSORIES.
 - EXISTING UNDERGROUND PIPING TO REMAIN.
 - PROVIDE NEW 3" CONNECTION TO THE EXISTING CHWS/R UNDERGROUND PIPING RISER.
 - PROVIDE NEW CHAIN-LINK FENCE.
 - PROVIDE NEW CHAIN-LINK FENCE 6'-0" WIDE DOOR.
 - EXISTING GENERATOR TO REMAIN OPERATIONAL DURING CONSTRUCTION.
 - LOCATION OF NEW AIR HANDLING UNIT, AHU-4, WITH DRAIN PAN AND AUX DRAIN PAN WITH FLOAT SWITCH. REFER TO DETAIL ON SHEET M201.
 - CONNECT NEW 14x14 SUPPLY AIR DUCTWORK FROM AHU TO EXISTING SUPPLY DUCTWORK AS SHOWN.
 - CONNECT NEW 12x12 OUTSIDE AIR DUCTWORK TO EXISTING INTAKE ON ROOF.
 - CONNECT NEW 2" CHWS/R PIPING WITH ISOLATION VALVES TO EXISTING 2" PIPING.
 - PROVIDE NEW SUPPLY AIR DIFFUSERS WITH NEW BRANCH DUCTWORK AND FLEX. BALANCE DIFFUSERS TO NEW AIR VALVES SHOWN.
 - PROVIDE NEW RETURN AIR DUCTWORK TO EACH SPACE AS SHOWN WITH NEW RETURN GRILLES. BALANCE RETURN GRILLES WITH VALVES SHOWN.
 - PROVIDE NEW 3/4" CONDENSATE LINE FROM AHU TO EXISTING CONDENSATE DRAIN.
 - PROVIDE NEW 3/4" AUXILIARY CONDENSATE LINE ROUTED ABOVE RESTROOM SINK IN CEILING AS SHOWN.
 - PROVIDE NEW THERMOSTAT AND HUMIDISTAT LOCATED AS SHOWN.
 - 12x12 EXHAUST DUCT UP THROUGH EXISTING OPENING TO NEW EXHAUST FAN ON ROOF (EF-9). PROVIDE TRANSITIONAL ROOF CURB FOR NEW EXHAUST FAN.
 - 8x10 EA UP TO EXISTING GOOSENECK ON ROOF. GAP AND SEAL EXISTING GOOSENECK OPENING NOT USED IN RENOVATION.
 - PROVIDE BACKDRAFT DAMPER IN TRANSFER DUCT.

REVISIONS

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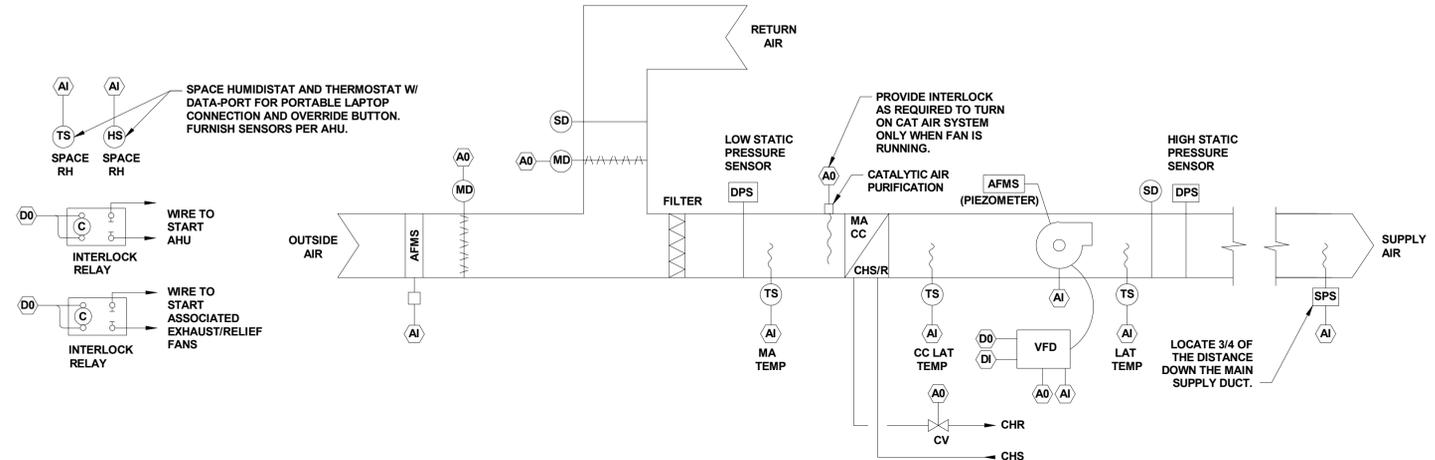
PHASE II - FLOOR PLAN - MECHANICAL
M211

ISSUE DATE 10/26/16
 JOB # GC-16-043

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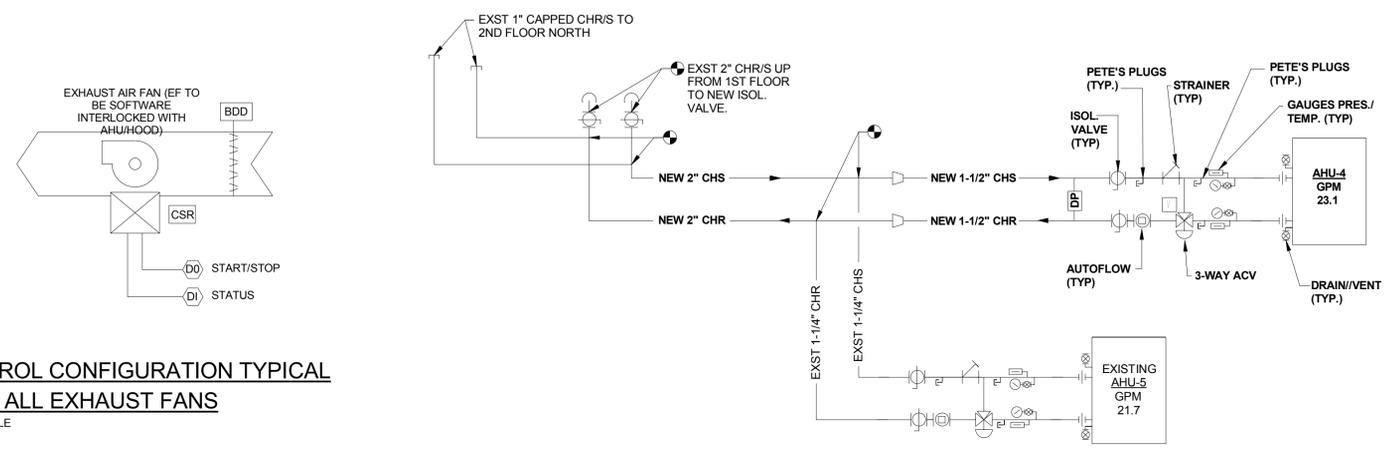
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SINGLE PATH - MIXED AIR - VAV AHU CONTROL SCHEMATIC
NO SCALE

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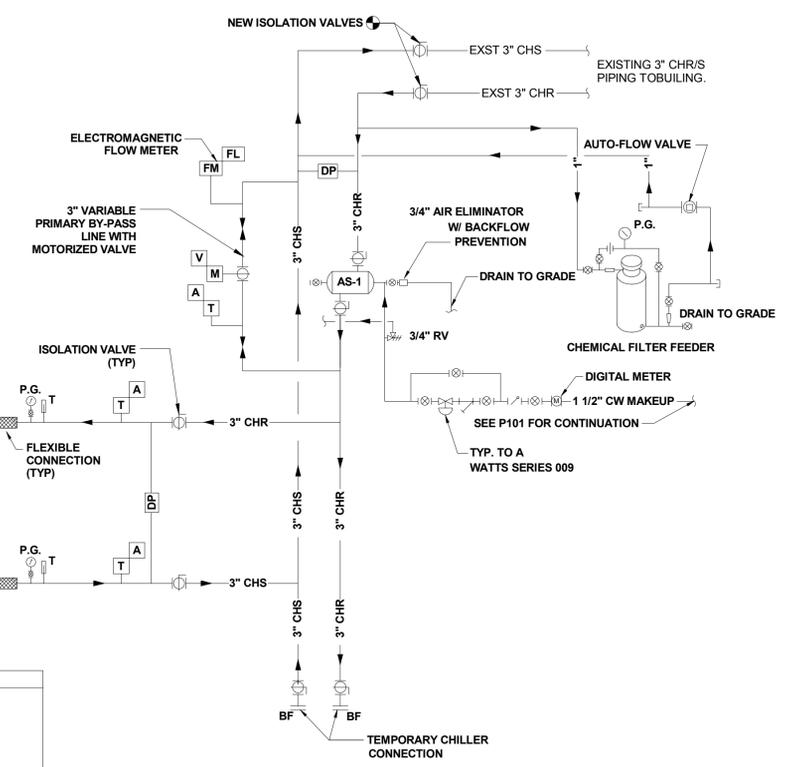


CONTROL CONFIGURATION TYPICAL FOR ALL EXHAUST FANS
NO SCALE

B

- SEQUENCE OF OPERATION - TOILET EXHAUST FANS:**
- GENERAL: THE TOILET EXHAUST FANS SHALL HAVE A SOFTWARE INTERLOCK WITH THE RESPECTIVE AIR-HANDLING UNIT SERVING THAT AREA.
- SEQUENCE OF OPERATION - LAB HOOD EXHAUST FANS:**
- THE HOOD EXHAUST FANS SHALL HAVE A SOFTWARE INTERLOCK WITH THE RESPECTIVE LABORATORY HOOD UNIT SERVING THAT AREA.
 - UPON START AND LOW FAN SPEED OPERATION OF HOOD EXHAUST FAN (EF-9), BAS SHALL MODULATE THE OUTSIDE AIR DAMPER OF AHU-4 OPEN TO 700 CFM. BAS SHALL MODULATE THE OA DAMPER OF AHU-4 TO 975 CFM UPON THE ACTIVATION OF THE HIGH FAN SPEED OF EF-9.

SECOND FLOOR - SOUTH - CHILLED WATER SCHEMATIC
NO SCALE

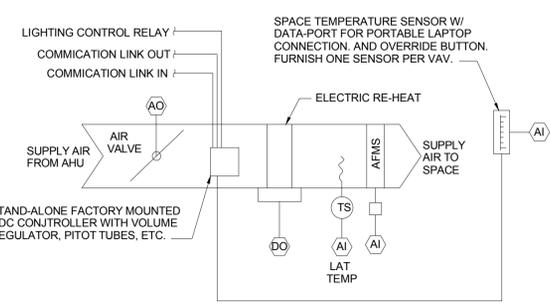


PUMP PACKAGE UNIT SCHEMATIC
NO SCALE

PUMP PACKAGE COMPONENTS (EVERYTHING NOT LABELED IN THIS CHART IS NOT PART OF THE PACKAGE)

ITEM	DESCRIPTION	ITEM	DESCRIPTION	ITEM	DESCRIPTION
1.	CENTRIFUGAL PUMP (DUAL PUMPS STD)	9.	AUTOMATIC AIR VENT	PI	GAUGE
2.	WATER STRAINER	10.	MANUAL AIR BLEED	FT	WATER FLOW SWITCH
3.	BUTTERFLY VALVE	11.	DRAIN VALVE	T1	EVAP. WATER INLET TEMP SENSOR
4.	INVERTER	12.	WATER HEATER (HEAT TAPE)	T2	EVAP. WATER OUTLET TEMP SENSOR
5.	VALVE FOR PRESSURE POINT	13.	BUFFER TANK	A	BUFFER TANK
6.	EXPANSION TANK			B	INSULATED PUMP BOX
7.	N/A			C	BRAZED PLATE DIFFERENTIAL PRESSURE GAUGE AND PIPING NOT SUPPLIED. MUST ACCOUNT FOR WATER HEAD HEIGHT DIFFERENCE WHEN CALCULATING BRAZED PLATE PRESSURE DIFFERENTIAL.
8.	EVAPORATOR HEAT EXCHANGER				

- SEQUENCE OF OPERATION - AIR HANDLING UNITS**
- VAV WITH AFD, 1 SAF, NO ELECTRIC HEAT, MIXED AIR (AHU 1-1, 1-2):**
- UNOCCUPIED:** WHEN THE BUILDING IS INDEXED FOR UNOCCUPIED OPERATION, THE UNIT SUPPLY FAN SHALL BE STOPPED, THE CHILLED WATER VALVES POSITIONED CLOSED, THE OUTSIDE AIR DAMPER SHALL BE POSITIONED CLOSED AND THE RETURN AIR DAMPER SHALL BE POSITIONED OPEN. ALL THE ASSOCIATED INTERLOCKED EXHAUST FANS SHALL BE STOPPED.
 - NIGHT SET-BACK:** THE SPACE TEMPERATURE SENSOR SHALL SIGNAL THE AIR HANDLING UNIT TO START WHEN ANY SPACE TEMPERATURE DROPS TO 64F (ADJUSTABLE). THE UNIT SHALL OPERATE AS DESCRIBED IN THE OPTIMAL START UP MODE.
 - NIGHT SET-UP:** THE SPACE TEMPERATURE SENSOR SHALL SIGNAL THE AIR HANDLING UNIT TO STOP WHEN ANY SPACE TEMPERATURE RISES TO 85F (ADJUSTABLE). THE UNIT SHALL STOP WHEN ALL TEMPERATURES DROP TO 80F. THE UNIT SHALL OPERATE AS DESCRIBED UNDER OPTIMAL SHUTDOWN MODE.
 - OPTIMAL START UP (30 MINUTE PRE-OCCUPIED MODE):** WHEN THE OPTIMAL START PROGRAM CALLS FOR THE BUILDING CHILLED WATER SYSTEM TO ENERGIZE, THE UNIT SHALL BE STARTED AND OPERATE WITH 100% RETURN AIR. THE UNIT SHALL BE STAGED TO RUN AT THE RETURN AIR CFM VALUE LISTED ON THE SCHEDULE, THE OA DAMPER SHALL REMAIN CLOSED AND ALL EXHAUST FANS SHALL BE OFF. THE DISCHARGE TEMPERATURE SHALL BE CONTROLLED BETWEEN 52F-55F LAT. THIS OCCURS SO THE BUILDING HVAC SYSTEM IS OPERATIONAL PRIOR TO ANY OCCUPANTS ENTERING THE BUILDING.
 - OPTIMAL SHUTDOWN (30 MINUTE POST-OCCUPIED MODE):** WHEN THE OPTIMAL SHUTDOWN PROGRAM CALLS FOR THE CHILLED WATER SYSTEM TO PERFORM AN ORDERLY CAMPUS SHUTDOWN, DUE TO THE SYSTEM ENTERING THE UNOCCUPIED MODE, THE UNITS SHALL BE STAGED "ON" FOR A MAXIMUM OF 30 MINUTES. AHUS THAT ARE NOT CURRENTLY ENERGIZED "ON" WILL NOT BE TURNED "ON", BUT ANY AHUS THAT ARE ENERGIZED WILL REMAIN ON FOR THE EXTENDED 30 MINUTES. DURING THIS TIME/MODE THE UNIT SHALL BE STAGED TO RUN AT THE RETURN AIR CFM VALUE LISTED ON THE SCHEDULE, THE OA DAMPER SHALL REMAIN CLOSED AND ALL EXHAUST FANS SHALL BE OFF. THE DISCHARGE TEMPERATURE SHALL BE CONTROLLED BETWEEN 52F-55F LAT. THIS OCCURS SO THE BUILDING HVAC IS OPERATIONAL DURING THE END OF DAY, WHEN OCCUPANTS ARE VACATING THE BUILDING(S).
 - UNOCCUPIED OVERRIDE:** AN OVERRIDE MODE SHALL BE PROVIDED THAT WILL PERMIT OPERATION OF THE AIR HANDLING UNIT TO FEED THE ZONE IN OVERRIDE (TIME TO BE ADJUSTABLE). WHEN IN OVERRIDE, THE UNIT SHALL OPERATE AS DESCRIBED FOR OCCUPIED OPERATION EXCEPT THAT THE OUTDOOR AIR DAMPER SHALL REMAIN CLOSED. THE ASSOCIATED EXHAUST FANS SHALL REMAIN OFF. OVERRIDE MAY BE ACCOMPLISHED BY USE OF THE OVERRIDE BUTTON ON THE ROOM TEMPERATURE SENSOR OR BY MANUAL INPUT TO THE COMPUTER.
 - OCCUPIED:** WHEN THE BUILDING IS INDEXED FOR OCCUPIED OPERATION, IF THE UNIT IS NOT RUNNING, THE UNIT SHALL BE STARTED AND THE UNIT OUTDOOR AIR DAMPER SHALL BE MODULATED 100% OPEN OR UNTIL THE OA SET POINT IS MET. IF THE OA IS STILL LOW WHEN THE DAMPER IS 100% OPEN, THEN THE RETURN AIR DAMPER SHALL BE MODULATED TO MAINTAIN THE MINIMUM OUTSIDE AIR QUANTITY SCHEDULED. ALL ASSOCIATED EXHAUST FANS SHALL BE STARTED ONLY AFTER THE UNIT OA DAMPERS HAS BEEN PROVEN OPEN. THE ACTUAL TIME FOR OCCUPIED OPERATION SHALL BE ONE HOUR PRIOR TO THE NORMAL OCCUPANCY TIME TO PERMIT AN IAQ PRE-OPERATION PERIOD.
 - COOLING COIL CONTROL:** THE COOLING COIL VALVE SHALL MODULATE DURING OCCUPIED AND UNOCCUPIED MODE OPERATION TO MAINTAIN A 54F COIL LAT.
 - HUMIDITY CONTROL:** ON A RISE IN SPACE AIR RELATIVE HUMIDITY ABOVE 60% RH, THE CHILLED WATER CONTROL VALVE SHALL BE MODULATED TO FULL OPEN, AND THE VAV ZONE HEATING COIL SHALL BE MODULATED TO MAINTAIN THE SPACE TEMPERATURE. THE SYSTEM SHALL REMAIN UNDER THIS CONTROL UNTIL THE SPACE AIR RELATIVE HUMIDITY DROPS BELOW 52% RH. IN THE EVENT OF CHILLED WATER FLOW OR HIGH TEMPERATURE ALARM, DURING THIS MODE, GENERATE AN ALARM AND DO NOT ACTIVATE THE HUMIDITY CONTROL MODE.
 - SPACE TEMPERATURE CONTROL:**
 - MIXED AIR COIL CONTROL:** ON A RISE IN DISCHARGE TEMPERATURE, THE CHILLED WATER VALVES SHALL BE MODULATED OPEN. THE COOLING COIL CONTROL VALVES SHALL MODULATE TO MAINTAIN A COIL DISCHARGE TEMPERATURE OF 54F.
 - COOLING MODE SUPPLY AIR TEMPERATURE RESET:** COIL DISCHARGE TEMPERATURE SETPOINT SHALL RESET UP IN A "STEP" FASHION BASED ON AFD SPEED AND SPACE HUMIDITY. RESET SET POINTS TO BE ADJUSTABLE THROUGH THE BCS. PROVIDE ONE STEP OF RESET TO STEP UP COOLING COIL LEAVING AIR TEMPERATURE 2 DEGREES F. TO A MAXIMUM SAT OF 58F. IF A CALL FOR COOLING IN THE CRITICAL ZONE OCCURS OR IF THE SPACE HUMIDITY EXCEEDS 60%RH, SUPPLY AIR RESET SHALL BE DISCONTINUED AND COIL DISCHARGE TEMPERATURE SET BACK TO 54F.
 - SUPPLY FAN AND DUCT PRESSURE CONTROL:**
 - THE BUILDING CONTROL SYSTEM (BCS) SHALL CONTINUOUSLY MONITOR THE DAMPER POSITION OF ALL VAV TERMINAL UNITS. THE DISCHARGE DUCT STATIC PRESSURE SHALL BE SENSED DIRECTLY AT THE DISCHARGE OF EACH AIR HANDLER. THE SENSOR MUST BE MOUNTED IN A NON-TURBULENT LOCATION.
 - WHEN ANY VAV DAMPER IS MORE THAN 75% (ADJ.) OPEN, THE SUPPLY FAN DISCHARGE DUCT STATIC PRESSURE SETPOINT SHALL BE RESET UPWARD BY 0.1 IN W.C. (ADJ.), AT A FREQUENCY OF 15 MINUTES (ADJ.), UNTIL NO DAMPER IS MORE THAN 75% OPEN OR THE STATIC PRESSURE SETPOINT HAS RESET UPWARD TO THE SYSTEM MAXIMUM DUCT STATIC PRESSURE SETPOINT OR THE AHU VARIABLE-FREQUENCY DRIVE IS AT THE MAXIMUM SPEED SETTING.
 - WHEN ALL VAV DAMPERS ARE LESS THAN 65% (ADJ.) OPEN, THE SUPPLY FAN DISCHARGE DUCT STATIC PRESSURE SETPOINT SHALL BE RESET DOWNWARD BY 0.1 IN W.C.(ADJ.), AT A FREQUENCY OF 15 MINUTES (ADJ.), UNTIL AT LEAST ONE DAMPER IS MORE THAN 65% OPEN OR THE STATIC PRESSURE SETPOINT HAS RESET DOWNWARD TO THE SYSTEM MINIMUM DUCT STATIC PRESSURE SETPOINT OR THE AHU VARIABLE-FREQUENCY DRIVE IS AT THE MINIMUM SPEED SETTING.
 - THE CONTROL BANDS, SETPOINT INCREMENT VALUES, SETPOINT DECREMENT VALUES AND ADJUSTMENT FREQUENCIES SHALL BE ADJUSTED TO MAINTAIN MAXIMUM STATIC PRESSURE OPTIMIZATION WITH STABLE SYSTEM CONTROL AND MAXIMUM COMFORT CONTROL.
 - THE BCS SHALL HAVE THE CAPABILITY TO ALLOW THE OPERATOR TO EXCLUDE "PROBLEM" ZONES THAT SHOULD NOT BE CONSIDERED WHEN DETERMINING THE OPTIMIZED SETPOINT.
 - THE BCS SHALL ALSO READ THE STATUS OF THE SUPPLY AIR STATIC PRESSURE SENSOR AND DISPLAY THE ACTIVE DUCT STATIC PRESSURE READING ON THE STATUS SCREEN.
 - THE BCS SHALL HAVE THE ABILITY TO IDENTIFY, AND DISPLAY TO THE USER, THE VAV BOX THAT SERVES THE CRITICAL ZONE (THAT IS, THE ZONE WITH THE MOST WIDE-OPEN VAV DAMPER). THIS INFORMATION SHALL UPDATE DYNAMICALLY AS THE LOCATION OF THE CRITICAL ZONE CHANGES BASED ON BUILDING LOAD, AND DUCT STATIC PRESSURE SETPOINT OPTIMIZATION CONTROL.
 - SMOKE CONTROL:** SHOULD PRODUCTS OF COMBUSTION BE DETECTED BY THE SUPPLY AIR SMOKE DETECTORS, THE SUPPLY FAN SHALL BE STOPPED AND THE FAN DISCHARGE SMOKE DAMPER, OUTDOOR AND RETURN AIR DAMPERS SHALL BE CLOSED.
 - FREEZE PROTECTION ALARM:** SHOULD THE MIXED AIR TEMPERATURE DROP TO 35F, THE CONTROL SYSTEM SHALL GENERATE AN ALARM. ALL COOLING COIL MODULATING VALVES SHALL GO TO 100% OPEN AND THE PRIMARY CHILLED WATER PUMP SHALL RUN AT 100% UNTIL THE ALARM IS RESET OR THE OA TEMPERATURE SENSOR IS ABOVE 40F.
 - CAT AIR SYSTEM:** PROVIDE BAS DRY CONTACT OUTPUT FOR ON/OFF STATUS. PROVIDE INTERLOCK AS REQUIRED TO TURN ON CAT AIR SYSTEM ONLY WHEN FAN IS RUNNING.



VARIABLE VOLUME TERMINAL W/ REHEAT
NO SCALE

- VAV PRIMARY AIR, ELECTRIC HEAT, NO FAN:**
- UNOCCUPIED:** WHEN THE BUILDING IS INDEXED FOR UNOCCUPIED OPERATION, THE TERMINAL PRIMARY AIR DAMPER SHALL BE CLOSED AND THE HEATER CYCLED OFF.
 - NIGHT SET-UP:** THE TERMINAL CONTROLLER SHALL OPEN AND START THE AIR HANDLING UNIT FAN. THE PRIMARY AIR DAMPER SHALL OPEN WHEN THE SPACE TEMPERATURE RISES TO 90F. THE AHU SHALL STOP AND THE DAMPER SHALL CLOSE WHEN THE SPACE TEMPERATURE DROPS TO 85F. THE AIR HANDLING UNIT SHALL OPERATE AS DESCRIBED ABOVE.
 - OCCUPIED:** WHEN THE UNIT IS INDEXED FOR OCCUPIED OPERATION, THE UNIT SHALL CONTROL AT THE COOLING SET POINT OF 75F BY VARYING THE PRIMARY AIR DAMPER FROM ITS MINIMUM TO ITS MAXIMUM VALUE. ON A FALL IN SPACE TEMPERATURE BELOW A SETTING OF 72F, THE ELECTRIC HEATING COIL SHALL BE CYCLED ON.
 - THE CONTROLS SHALL BE ARRANGED FOR PRESSURE INDEPENDENT OPERATION, I.E., THE DAMPER POSITION SHALL BE SET BY THE FLOW SENSOR, AND THE SPACE TEMPERATURE WILL RESET THE FLOW SENSOR SO THAT PRIMARY AIR FLOW WILL BE CONSTANT AT ANY SETPOINT, REGARDLESS OF CHANGES IN PRIMARY DUCT PRESSURE.
 - CONTROL POINT DESCRIPTION (REFER TO THE DRAWINGS).

CONTROLS LEGEND

AFD	ADJUSTABLE FREQUENCY DRIVE	FS	FLOW SWITCH
AFMS	AIR FLOW MEASURING STATION	HS	HUMIDITY SENSOR
AI	ANALOG INPUT	HC	HEATING COIL
AO	ANALOG OUTPUT	HL	HUMIDITY SENSOR (HIGH LIMIT)
BDD	BACK DRAFT DAMPER	IAQ	INDOOR AIR QUALITY SENSOR
CC	COOLING COIL	ID	ION DETECTOR
CHS	CHILLED WATER SUPPLY	LAT	LEAVING AIR TEMPERATURE
CHR	CHILLED WATER RETURN	MS	MOTOR STARTER/DISCONNECT
CSR	CURRENT SENSING RELAY	OA	OUTSIDE AIR
CV	CONTROL VALVE	PD	DISCHARGE STATIC PRESSURE
MD	MOTORIZED DAMPER	R	RELAY
DI	DIGITAL INPUT	RA	RETURN AIR
DO	DIGITAL OUTPUT	RH	RELATIVE HUMIDITY
DP	DIFFERENTIAL PRESSURE	Sa	SAFETY ALARM/SHUT-DOWN
DPS	DIFFERENTIAL PRESSURE SWITCH	SA	SUPPLY AIR
EHC	ELECTRIC HEATING COIL	SD	SMOKE DETECTOR
ES	END SWITCH	SPS	STATIC PRESSURE SENSOR
F	AFD FAILURE ALARM	S/S	START-STOP
Fa	FAILURE ALARM	TEMP	TEMPERATURE
FR	FREEZESTAT	TS	TEMPERATURE SENSOR

NOTE:
SEE SPECIFICATIONS - SECTION 23 09 93 FOR MORE INFORMATION

CONTROL LEGEND (23-09-93)

DP	DIFFERENTIAL PRESSURE SENSOR
S/S	START - STOP
AFD	ADJUSTABLE FREQUENCY DRIVE
CSR	CURRENT SENSING RELAY
T	TEMPERATURE SENSOR
MPT	MATCHED PAIR OF TEMPERATURE SENSORS
V	CONTROL VALVE - AUTOMATIC
FL	TRANSDUCER ON INSERTION FLOWMETER FOR FLOW MONITORING - ELECTROMAGNETIC
A	ALARM
CT	CURRENT TRANSFORMER FOR CURRENT DRAW
FM	ONICON MODEL FLOW F-3500 METER (NO SUBSTITUTION)

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SCHMATICS - MECHANICAL
M501
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CITY OF TAVARES CITY HALL
Object Data Points and Configurations for CGAM

W/E: Air Sensing Input, A/I = Analog Output, P/A = Binary Input, P/O = Binary Output, M/A = Multi-state Input, M/O = Multi-state Output

Table with columns: Object Type, Instance #, Object Name, CGAM, Object Description, Present Value, Units of Measure. Rows include Active Cool/Heat Setpoint Temperature, Active Demand Limit Setpoint, Actual Running Capacity, Suction Pressure, Discharge Pressure, Unit Power Consumption, Local Atmospheric Pressure, Starts- Compressor, Run Time- Compressor, Airflow Percentage, Evaporator Entering/Leaving Water Temp, Outdoor Air Temperature, Number of Circuits/Compressors, Chiller Design Capacity.

Table with columns: Object Type, Instance #, Object Name, CGAM, Object Description, Present Value, Units of Measure. Rows include Chilled Water Setpoint, Demand Limit Setpoint.

Table with columns: Object Type, Instance #, Object Name, CGAM, Object Description, Present Value, Units of Measure. Rows include Run Enabled, Local Setpoint Control, Capacity Limited, Chiller Running State, Maximum Capacity, Compressor 1A-2C Running, Evaporator Water Pump Request, Water Pump Request, Noise Reduction Active, Defrost Mode.

Table with columns: Object Type, Instance #, Object Name, CGAM, Object Description, Present Value, Units of Measure. Rows include Evaporator Water Flow Status, Alarm Present, Shutdown Alarm Present, Last Diagnostic, Chiller Auto Stop Command, Remote Diagnostic Reset Command, Noise Reduction Request, Running Mode, Operating Mode, MP Communication Status, Refrigerant Type, Model Information, Cooling Type, Manufacturing Location, Chiller Mode Command.

SEQUENCE OF OPERATION - CHILLED WATER SYSTEM

- A. GENERAL CHILLED WATER SYSTEM DESCRIPTION: THE CHILLED WATER SYSTEM WILL BE COMPOSED OF ONE AIR COOLED WATER CHILLING UNIT WITH AN INTEGRAL PUMP PACKAGE AND AFD CONTROL...
B. CAMPUS KW/TON MEASUREMENT: THE ELECTRICAL KWH CONSUMED BY THE CHILLERS AND CHILLED WATER PUMPS SHALL BE MEASURED FROM THEIR RESPECTIVE AFD'S AND USED IN THE KWH/TON CALCULATION WHICH SHALL BE DIVIDED BY THE TONNAGE RATE SENSED BY THE ONICON BTUH METER.
C. PACKAGED CHILLER CONTROLS: THE BCS CONTRACTOR SHALL FULLY COORDINATE THIS SEQUENCE WITH THE LOGIC OF THE PACKAGE CHILLER/PUMP CONTROLLER AND THE INTERNAL SEQUENCE FROM THE MANUFACTURER.
D. CHILLER START/STOP CONTROL:
1. CHILLER START: WHEN THE BUILDING CONTROL SYSTEM DECIDES THAT THE CHILLER NEEDS TO BE STARTED TO SUPPLY CHILLED WATER TO THE CAMPUS AND MINIMUM CHILLED WATER FLOW THROUGH THE EVAPORATOR HAS BEEN ESTABLISHED BY THE CHILLED WATER PUMP...
2. CHILLER FAILURE: IN THE EVENT THAT ONLY THE CHILLER IS OPERATING AND THERE IS A CHILLER FAILURE, AN ALARM SHALL BE GENERATED.
E. CHILLER MINIMUM FLOW CONTROL: THE BCS SYSTEM SHALL MONITOR THE CHILLED WATER FLOW THROUGH THE CHILLER EVAPORATOR BARREL TO ENSURE THAT THE MINIMUM FLOW IS MAINTAINED THROUGH THE EVAPORATOR BY DIRECTLY MEASURING THE TIME AVERAGED PLANT CHILLED WATER FLOW...
F. CHILLED WATER PUMP CONTROL:
1. INITIAL OR NORMAL PLANT START UP: LEAD CHILLED WATER PUMP SHALL BE STARTED.
2. PRIMARY PUMP SPEED CONTROL: THE LEAD PUMP SHALL BE STARTED BY A REMOTE SIGNAL FROM THE BUILDING CONTROL SYSTEM...
3. FAILURE OF LEAD OR LAG PUMP: IN THE EVENT THAT THE LEAD OR LAG CHILLED WATER PUMP HAS FAILED, AS DETERMINED BY A LACK OF DIFFERENTIAL PRESSURE ACROSS AN OPERATING PUMP...
4. LEAD/LAG CHILLED WATER PUMP CONTROL: THE OPERATOR, THROUGH A GRAPHICS SCREEN SHALL BE ABLE TO SWITCH THE LEAD-LAG SEQUENCE OF THE OPERATING PUMPS WITHOUT DISRUPTION OF THE OPERATING SYSTEM.
G. CHILLED WATER HEADER TEMPERATURE MONITORING: PROVIDE TEMPERATURE SENSORS IN THE SUPPLY AND RETURN CHILLED WATER HEADER AS SHOWN ON THE FLOW SCHEMATIC.

Table with columns: POINT, TYPE, DESCRIPTION, ALARM, COMMENTS. Rows include LOCAL DRY BULB TEMPERATURE (T), LOCAL RELATIVE HUMIDITY (RH), CHILLER START/STOP (S/S), CHILLER MALFUNCTION ALARM (A), CHILLER BAGNET POINTS, CHILLER EVAPORATOR ISOLATION VALVE (V) (ES), CHILLED WATER PUMP #1 START/STOP (S/S), CHILLED WATER PUMP #2 START/STOP (S/S), CHILLED WATER PUMP #1 STATUS (DP), CHILLED WATER PUMP #2 STATUS (DP), CHILLED WATER PUMP #1 AFD SIGNAL (AFD), CHILLED WATER PUMP #2 AFD SIGNAL (AFD), CHILLED WATER PUMP #1 AFD FAULT (AFD), CHILLED WATER PUMP #2 AFD FAULT (AFD), CHILLED WATER SUPPLY TEMP (T), PLANT KW/TON, PLANT KW ENERGY USAGE, CAMPUS REMOTE DIFFERENTIAL PRESSURE(DP), PLANT CHILLED WATER FLOW (FM), MINIMUM FLOW BYPASS VALVE (V) (ES).

Table with 2 columns: REVISIONS, Description. Empty table.

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SCHEMATICS - MECHANICAL
M502
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AIR COOLED LIQUID CHILLER SCHEDULE:

UNIT NO.	MIN. TONS	EER	A-WEIGHTED SOUND PRESSURE EXTERNAL FT. HEAD @ DESIGN	PUMP DATA		CONDENSER DATA				COOLER DATA						COMPRESSOR DATA					UNIT ELECTRICAL DATA				SELECTION BASED ON		REMARKS													
				NO. PUMPS	VOLUME (GAL.)	EAT °F	QUANTITY	SIZE DIA.	HP EACH	FLA EACH	FLUID	FOUL FACT	EWT °F	LWT °F	DESIGN GPM	MINIMUM GPM	P FT H2O @ DESIGN	KW TOTAL	NO.	VOLT	PH	COMP A	COMP B	COMP C	COMP D	COMP E		VOLTS	PH	MCA	MOCP	MANUFACTURER	MODEL							
CH-1	57.7	10.8	14.6	64	70	1 (DUAL ARM)	136	95	6	28.8"	1.3	20.2	WATER	0.0001	55	45	138	83.9	12.4	56.4	4	460	3	24.2	197	24.2	197	24.2	197	24.2	197	24.2	197	460	3	140.8	150	TRANE	CGAM	1-11

NOTES:

- CHILLER IS TO HAVE SCROLL COMPRESSORS
- CHILLER SHALL BE CAPABLE OF MAINTAINING A LEAVING WATER TEMPERATURE OF +/- 2 F WITH CHANGES UP TO 10% PER MINUTE OF FLOW RATE
- PROVIDE BACNET OPEN PROTOCOL INTERFACE AND ALARM RELAY
- PROVIDE FACTORY INSTALLED LOSS OF FLOW PROTECTION
- NOT USED
- SCHEDULED SOUND PRESSURE IS MEASURED AT 30' FROM THE SIDE OF THE CHILLER
- PROVIDE LOUVERED COIL PROTECTION FOR THE ENTIRE CHILLER (COILS AND COMPRESSOR ACCESS)
- PROVIDE (1) ONE 40 AMP 115/1 CIRCUIT FOR HEAT TAPE
- PROVIDE SINGLE POINT POWER CONNECTION
- CHILLER TO HAVE A 65,000 AIC RATING
- CHILLER TO HAVE INTEGRAL PUMPS, DUAL ARM & BUFFER TANK
- REDUNDANT CHILLER FOR EOC HARDENED ZONE

PACKAGED AIR HANDLING UNIT SCHEDULE:

UNIT NO.	SERVING	TOTAL MAX CFM	PRIMARY CFM	O.A. CFM	DCV O.A. CFM	SUPPLY AIR FAN DATA				MOTOR DATA				COOLING COIL DATA										FILTER DATA			SELECTION BASED ON		REMARKS										
						FAN QUANTITY	ESP IN H2O	TSP IN H2O	FAN DIA.	BLADE TYPE	HP PER FAN	BHP PER FAN	FAN RPM	VOLT	PH	CFM	EAT F	LAT F	AIR PD IN H2O	GPM	EWT F	LWT F	MAX WATER PD FT H2O	MIN. ROWS	FINS/IN	FACE AREA	MIN FACE AREA - FT2	TOTAL CAP. (TONS)		TOTAL CAP. (MBH)	SENS. CAP. (MBH)	LEED FILTRATION REQUIREMENT	AIR PRESSURE DROP AT MID LIFE CONDITION	QUANTITY & SIZE	MANUF.	MODEL			
AHU-4	1ST FLOOR EAST LIVING AREA	2,200	1,225	975	N/A	1	1.0	2.2		DD PLENUM	3	1.612	2260	480	3	2,200	84.4	69.3	52.4	53.3	0.656	23.13	45	55	12	8	10			2.03	8	101	70	MERV 15			TRANE	UCCA	1,2,3,4,5,6,7,8

REMARKS:

- UNIT TO HAVE SIDE DISCHARGE (AS SHOWN ON DRAWINGS) AND DISCHARGE AIR PLENUM
- VAV / VFD CONTROLLED
- PROVIDE FACTORY MOUNTED AND WIRED VFD INSIDE ACCESS SECTION PRIOR TO FAN.
- PROVIDE DOOR HANDLES ON ALL ACCESS DOORS.
- REFER TO THE SPECIFICATIONS FOR ALL REQUIREMENTS BEYOND THIS SCHEDULE
- HORIZONTAL DRAW THROUGH/ SIDE DISCHARGE
- PROVIDE STAINLESS STEEL DRAIN PAN.
- PROVIDE A SMOKE DETECTOR IN THE SUPPLY AND RETURN AIR STREAM. UNIT SHALL AUTOMATICALLY SHUTDOWN UPON THE DETECTION OF SMOKE AND THE ACTIVATION OF AN AUTOMATIC SPRINKLER WATER FLOW ALARM.

NOTE: 1. THE VENTILATION RATE PROCEDURE USED FOR THIS PROJECT COMPLIES WITH ASHRAE STANDARD 62.1-2010

AIR SEPARATOR:

UNIT NO.	SERVING	SYSTEM FLOW RATE (GPM)	SYSTEM CONN.(IN.)	VENT CONN. (IN.)	PRESSURE DROP (FT. H2O)	DIMENSIONS		SELECTION BASED ON:		REMARKS
						HEIGHT (IN.)	DIAM. (IN.)	MANUFACTURER	MODEL	
AS-1	CITY HALL	138	4	1.5	<1	31 1/2	12 3/4	B&G	RL-4F	1

REMARKS:
1. AIR SEPARATOR TO BE STRAINER-LESS

GRILLE, REGISTER AND DIFFUSER SCHEDULE:

UNIT NO.	TYPE			SERVICE			MOUNTING DATA			CONSTRUCTION DATA					SELECTION BASED ON:		REMARKS		
	G	R	D	SA	RA	EA	CEILING	DUCT	WALL	SHAPE	MATERIAL	COLOR	1-W	2-W	3-W	4-W		E/R	MANUFACTURER
G-1			X	X			X		HIGH	LOW	SQUARE	ALUM.	WHITE					TITUS	TMS-AA
G-2	X					X	X				SQUARE	ALUM.	WHITE					TITUS	50F

NOTES:
1 ALL CEILING MOUNTED GRILLES SHALL BE 24"x24" UNLESS OTHERWISE NOTED ON THE DRAWINGS
2 GRILLE TO BE DOOR MOUNTED

VAV TERMINAL BOX WITH AND WITHOUT ELECTRIC HEATING COIL SCHEDULE

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UNIT DESIGNATION	SERVING	AIR DATA		ELECTRIC HEATING COIL										SELECTION BASED ON			REMARKS				
		TOTAL CFM	MAX CFM	OA MIN CFM	MIN BOX FLOW CFM	°F	DELTA P IN H2O	HEATING CFM	EAT °F	LAT °F	CAPACITY BTUH	KW	VOLTS	PHASE	STEPS	MANUFACTURER	MODEL	INLET SIZE (IN)	1	2	3
VAV-12	OFFICES	600	600	75	105	53.0	0.05	300	53.0	84.5	10239	3.0	277	1	2	TRANE	VCEF	8	1	2	---
VAV-13	OFFICES	500	500	150	105	53.0	0.05	250	53.0	84.5	8532.5	2.5	277	1	2	TRANE	VCEF	8	1	2	---
VAV-14	OFFICES	725	725	75	105	53.0	0.11	362.5	53.0	83.4	11945.5	3.5	277	1	2	TRANE	VCEF	8	1	2	---
VAV-15	OFFICES	450	450	75	105	53.0	0.05	225	53.0	81.0	6826	2.0	277	1	2	TRANE	VCEF	8	1	2	---

REMARKS:

- REFER TO THE SPECIFICATIONS FOR VAV ACCESSORY REQUIREMENTS
- PROVIDE FACTORY MOUNTED STEP-DOWN TRANSFORMER FOR CONTROLS. TRANSFORMER VOLTAGE SHALL MATCH THE INCOMING HEATER VOLTAGE
- FOR UNITS THAT DO NOT HAVE ELECTRIC HEAT PROVIDE A 120 VOLT STEP-DOWN TRANSFORMER FOR CONTROLS

EXHAUST FAN SCHEDULE:

UNIT NO.	SERVING	TYPE	CFM	BLADE TYPE	SONES	TOTAL STATIC IN H2O	FAN RPM	MOTOR DATA				EHPA	SELECTION BASED ON:		REMARKS
								HP	RPM	VOLT	PH		MISSILE IMPACT	MANUFACTURER	
EF-8	2ND FLOOR EAST RESTROOMS	INLINE DIRECT DRIVE	225	BI	8.5	0.25	1539	1/10	1725	115	1	NO	GREENHECK	SQ-75-VG	1-3,5-7
EF-9	2ND FLOOR LAB HOOD	ROOF MOUNTED DIRECT DRIVE	750	BI	8.6	0.375	1301	1/4	1725	115	1	NO	GREENHECK	G-099-VG	1-4,8,9

REMARKS:

- PROVIDE BACKDRAFT DAMPER
- PROVIDE DISCONNECT AT THE UNIT
- EC MOTOR, CONTROLLED BY POTENTIOMETER MOUNTED ON MOTOR
- PROVIDE ROOF CURB
- INTERNALLY LINE FAN FOR SOUND-PROOFING
- PROVIDE VIBRATION ISOLATION HANGERS
- SOFTWARE INTERLOCK FAN WITH RESPECTIVE AHU (AHU-4)
- INTERLOCK WITH LAB HOOD CONTROL PANEL
- FAN TO BE BALANCED AND CONTROLLED TO THE HIGH/LOW CFM VALUE OF LAB HOOD.

GENERAL COMMENTS:

- ALL ROOF MOUNTED FANS TO BE FLORIDA PRODUCT APPROVED AND TIED DOWN PER THE DETAILS SHEET
- ALL INLINE FANS WITH EXTERIOR MOTORS (NOT IN THE AIRSTREAM) TO HAVE AN INSULATED & VENTILATED FACTORY MOUNTED FAN ENCLOSURE BOX

VENTILATION RATE REQUIREMENT SCHEDULE

OCCUPANCY CATEGORY:	EDUCATIONAL FACILITIES	SPACE CLASSIFICATION	OCCUPANT COUNT	OUTDOOR AIR RATE	SQ. FT. OF AREA	DEFAULT VALUES			TOTAL OUTDOOR AIR CFM REQUIRED
						REQ'D CFM/SQ. FT.	OCCUPANT DENSITY/1000 SQ. FT.	COMBINED OUTDOOR AIR RATE CFM/PERSON	
AHU-4	226 Office	OFFICE SPACE	1	5	273	0.06	5	17	21
VAV-12	222 Storage	STORAGE ROOMS	0	0	172	0.12	0	0	21
VAV-13	223 Lab	UNIVERSITY/COLLEGE LABORATORIES	1	10	108	0.18	25	17	29
	224 Mens RR	TOILETS - PUBLIC	1	75	-	-	-	-	75
	225 Womens RR	TOILETS - PUBLIC	2	75	-	-	-	-	150
	228 Corridor	CORRIDORS	0	0	45	0.06	0	0	3
VAV-14	215 Office	OFFICE SPACE	1	5	128	0.06	5	17	13
	216 Office	OFFICE SPACE	1	5	149	0.06	5	17	14
	219 Office	OFFICE SPACE	1	5	173	0.06	5	17	15
	220 Office	OFFICE SPACE	1	5	139	0.06	5	17	13
VAV-15	217 Open Office	OFFICE SPACE	2	5	471	0.06	5	17	38
TOTAL REQUIRED FOR AHU-4									393
TOTAL SUPPLIED FOR AHU-4									975
BUILDING AIR BALANCE									
TOTAL OUTSIDE AIR									975
TOTAL EXHAUST AIR									975
TOTAL BUILDING PRESSURE									0

NOTE:
1. REQUIRED OUTSIDE AIR CFM VALUES BASED ON ANSI/ASHRAE STANDARD 62.1-2007.

Duct & Pipe Construction & Insulation Requirements Schedule

Service	Thickness	Type	Notes
Outside Air Plenum	Installed R-6	.75# density blanket	
Outside Air Duct	Installed R-6	.75# density blanket	
Factory Packaged Air Conditioning Unit Casing		Factory Furnished	
Factory Built Return Air Plenums/Mixing Boxes	Double Wall	Factory Furnished	No Field Built Plenums
Supply Air Ducts			
From AHU's connection to 50 feet downstream on supply side for all air handling unit systems:	1" internally lined installed R-6	with perforated inner liner and mylar film separating insulation from air stream	Double Wall Duct
After 50 feet downstream of AHU on supply side for all air handling units:	Installed R-6	Concealed - 2" thick external wrap Exposed- 1-1/2" rigid board with corner angles.	
Downstream of VAV terminals:	Installed R-6	Concealed - 2" thick external wrap Exposed- 1-1/2" rigid board with corner angles.	
All low pressure exposed ductwork in public areas:	1" internally lined installed R-6	with perforated inner liner and mylar film separating insulation from air stream	Double Wall Duct
AC Unit to Terminal - Balance of ductwork to terminal 90 deg air system:	Installed R-6	Exposed: 2" rigid fiberglass with corner angles Concealed: 2" with 1.5# density blanket	
AC Unit to Terminal - Balance of ductwork to terminal exposed 90 deg air system:	Installed R-6	Exposed: 2" rigid fiberglass with corner angles. Concealed: .75# density blanket.	
Terminal to Outlet:	Installed R-6	.75# density blanket.	
Fire Dampers and reheat coils in internally insulated duct:		Exposed: 1" rigid fiberglass with corner angles. Concealed: Installed R-6 with .75# density blanket.	
Return Air Ducts			
From AHU's connection to 50 feet upstream on return side for all air handling unit systems	1" internally lined installed R-4.2	with perforated inner liner and mylar film separating insulation from air stream	Double Wall Duct
All other return air ductwork:	Installed R-4.2	Concealed - 2" thick external wrap - 1-1/2" rigid board with corner angles	Exposed
Outside Air Ducts			
All outside air ducts:	Installed R-6	Concealed - 2" thick external wrap - 1-1/2" rigid board with corner angles.	Exposed
Exhaust Air Ducts			
All general restroom exhaust ducts:		Not Required	
Chilled Water (20 deg F to 40 deg F)			
Chilled Water (CHS) (CHR) (42 deg F and above) - Conditioned:		Up to 2": 1-1/2" Closed Cell Elast. 2-1/2" thru 4": 1-1/2" Foamglas 5" thru 8": 2" Foamglas 10" thru Larger: 2-1/2" Foamglas	with Aluminum Jacket in the CEP or to any exterior chillers
Chilled Water (CHS) (CHR) (42 deg F and above) - Unconditioned:		Up to 2": 1-1/2" Foamglas 2-1/2" thru 4": 2" Foamglas 5" thru 14": 2-1/2" Foamglas 16" thru Larger: 3" Foamglas	with Aluminum Jacket in the CEP or to any exterior chillers
Cold Pipe Hanger Support Blocks:		Match - Foamglas Insulation	
Floor Drains Receiving Condensate:	1/2"	Closed Cell Elastomeric	
Condensate Drain (CD): All sizes	1/2"	Closed Cell Elastomeric	
EQUIPMENT INSULATION REQUIREMENTS			
Expansion Tank:	1"	Closed Cell Elastomeric	
Filter Feeder:	1"	Closed Cell Elastomeric	
Chilled Water Buffer Tank:	2"	Closed Cell Elastomeric	with Aluminum Jacket
Chiller		Shell & Cold Surface: 1-1/2" Closed Cell Elast. Water Box: 1-1/2" Removable cover	

NOTES:
Refer to specification section 23-07-00 for more details and information
Insulation must meet or exceed FBC 2014 - Energy Conservation Code sections 503.2.7 through 503.2.8
Insulation must meet or exceed FBC 2014 - Mechanical Code sections 604.1 through 604.13
Insulation must meet or exceed ASHRAE 90.1-2010, Table 6.8.3

REVISIONS

CITY HALL HVAC UPGRADE
CITY OF TAVARES
201 E. MAIN STREET
TAVARES, FLORIDA, 32778

BID DOCUMENTS

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SIGN DATE

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SCHEDULES - MECHANICAL

M601
ISSUE DATE 10/26/16

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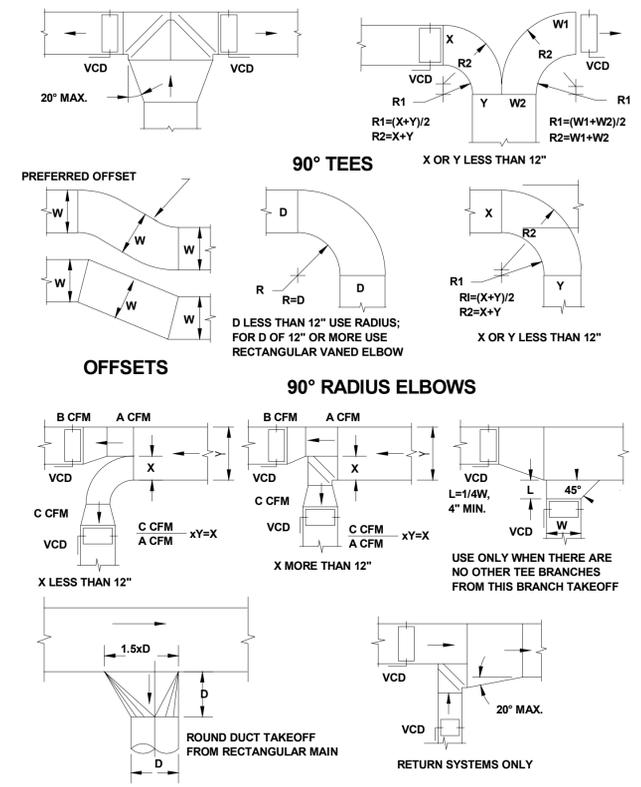
mp MATERN PROFESSIONAL ENGINEERING, INC.
396 S.W. 12th Avenue
APT. 101, Ft. Lauderdale, FL 33304
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MPE JOB #: 2016-166

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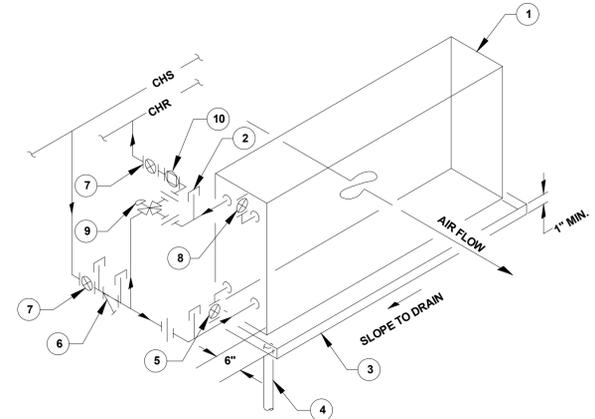
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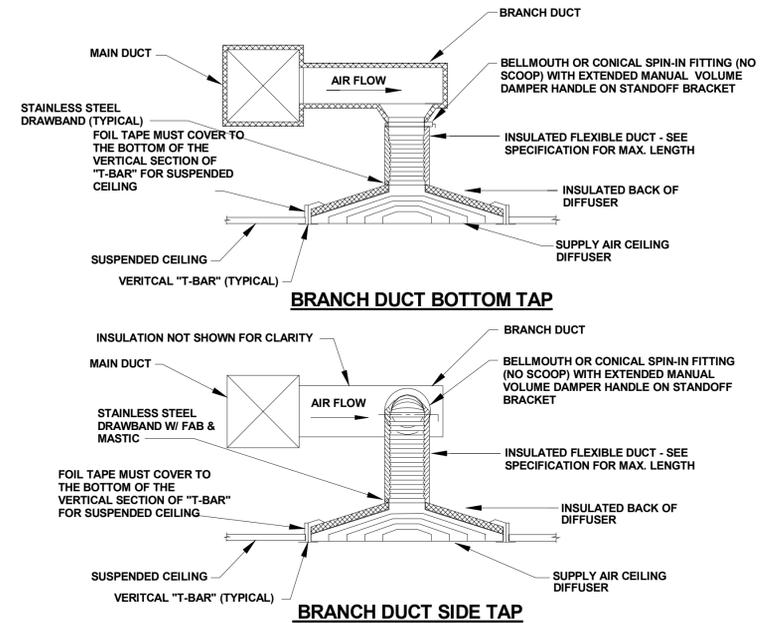
BRANCH TAKEOFFS
NO SCALE



- NOTES:**
1. CHILLED WATER COIL.
 2. PIT PLUG. (TYP.)
 3. 304 S.S. DRAIN PAN SURROUNDING BOTTOM OF COIL. REFER TO SPECIFICATIONS.
 4. 3/4" MIN. TO DRAIN. REFER TO DRAWINGS FOR SPECIFIC SIZE.
 5. 3/8" BALL VALVE AIR VENT.
 6. STRAINER (PROVIDE TEST PORTS ON BOTH SIDES OF THE DEVICE).
 7. BALL VALVE 2" OR LESS, BUTTERFLY VALVE 2-1/2" OR GREATER.
 8. 3/8" BALL VALVE AIR VENT.
 9. 3-WAY AUTOMATIC CONTROL VALVE.
 10. AUTOMATIC FLOW CONTROL VALVE (TYPICAL TO AN AUTO-FLOW) REFER TO SPECIFICATIONS FOR MODEL NUMBER.

NOTES:
 IF RUNOUTS FROM COILS EXCEED 2" IN SIZE USE BUTTERFLY AND Y-STRAINER ON SUPPLY, AND BUTTERFLY WITH URT OR FL ON RETURN.
 THIS COIL IS SHOWN PIPED FOR RIGHT HAND COIL CONNECTIONS, BOTTOM INLET, TOP OUTLET, & COUNTER FLOW. (ENTERING WATER TO THE LEAVING AIR). SOME COILS WILL BE PIPED LEFT HAND. SOME MANUFACTURERS USE AN OPPOSITE DESIGNATION FOR "HAND". COILS MAY HAVE THE SUPPLY IN THE TOP, CENTER, OR BOTTOM. HOWEVER THE COILS MUST BE PIPED FOR COUNTER FLOW. (ENTERING WATER TO LEAVING AIR).
 ALL COOLING COILS MUST BE PROVIDED WITH A CONDENSATE COLLECTING DRAIN PAN AND PIPED TO DRAIN. DRAIN PANS NOT FURNISHED AS A PART OF FACTORY BUILT A.C. UNITS SHALL BE CONSTRUCTED OF NOT LESS THAN 16 GA. COPPER SHEET OF 304 S.S.

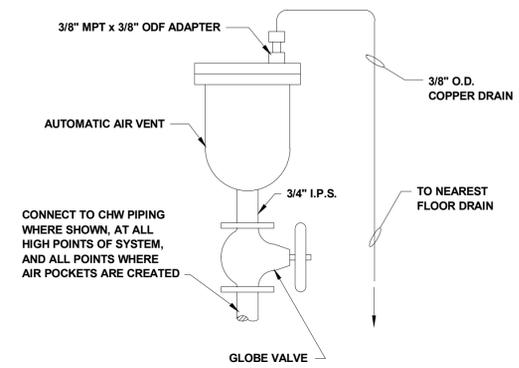
CHILLED WATER PIPING
SINGLE COIL, 3 - WAY VALVE
N.T.S.



INSULATION MUST BE SECURED TO BACK OF DIFFUSER BY ONE OF THE FOLLOWING METHODS:

- 1) INSULATE TOP SIDE OF THE DIFFUSER TO THE EDGE, PLACE THE DIFFUSER ON THE SUSPENDED CEILING GRID AND TAPE FROM THE LOWEST PART OF DIFFUSER EDGE TO THE BOTTOM OF VERTICAL SECTION OF THE T-BAR ON THE OPPOSITE SIDE OF THE T-BAR WHERE DIFFUSER RESIDES. NO INSULATION SHOULD BE SHOWING AFTER TAPING AND ALL THE HOLES ON THE VERTICAL SECTION OF T-BAR SHOULD BE COMPLETELY COVERED.
- 2) INSULATE TOP SIDE OF THE DIFFUSER TO THE EDGE LEAVING ONLY 1/4" COMPLETELY AROUND THE EDGE. TAPE FROM THE TOP SIDE TO THE EDGE AND THEN PLACE THE DIFFUSER IN PLACE. THIS METHOD ALLOWS FOR THE DIFFUSER TO BE MOVED IF NECESSARY. 1/4" SPACE AROUND THE TOP LIP OF THE DIFFUSER IS FOR TAPING PURPOSES ONLY.
- 3) INSULATE TOP SIDE OF THE DIFFUSER TO THE EDGE. FLIP THE DIFFUSER WITH THE EXPOSED AREA FACING UP. TAPE 1/4" ON ALL FOUR SIDES. FLIP THE DIFFUSER WITH EXPOSED AREA FACING DOWN AND ROLL ALL FOUR TAPES OVER THE INSULATION AND SEAL. THIS METHOD ALSO ALLOWS FRO THE DIFFUSER TO BE MOVED IF NECESSARY.

DIFFUSER CONNECTION DETAIL
NO SCALE



AUTOMATIC AIR VENT DETAIL
NO SCALE

REVISIONS

CITY HALL HVAC UPGRADE
CITY OF TAVARES
 201 E. MAIN STREET
 TAVARES, FLORIDA, 32778

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DETAILS - MECHANICAL

M902
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 MPE JOB #. 2016-166

D

C

B

A

GENERAL NOTES

- NO MULTI-WIRE BRANCH CIRCUITS ARE TO BE USED. EACH CIRCUIT IS TO HAVE SEPARATE INDIVIDUAL NEUTRAL.
- 120 VOLT BRANCH CIRCUITS, WHERE THE LENGTH OF CIRCUIT CONDUCTORS COMPLETE FROM CIRCUIT BREAKER IN SOURCE PANEL TO ANY DEVICE ON THE CIRCUIT IS 0-100 FEET, ARE TO HAVE #12 MINIMUM BRANCH CIRCUIT WIRING THROUGHOUT CIRCUIT. (CONDUIT SIZE PER SPECIFICATION AND NEC).
- 120 VOLT BRANCH CIRCUITS, WHERE THE LENGTH OF CIRCUIT CONDUCTORS COMPLETE FROM CIRCUIT BREAKER IN SOURCE PANEL TO ANY DEVICE ON THE CIRCUIT IS 101-125 FEET, ARE TO HAVE #10 MINIMUM BRANCH CIRCUIT WIRING THROUGHOUT CIRCUIT BREAKER TO FIRST DEVICE AND #12 BRANCH CIRCUIT WIRING THROUGHOUT THE REMAINDER OF THE CIRCUIT. (CONDUIT SIZE PER SPECIFICATION AND NEC), NOT LESS THAN THE FIRST 75 FEET OF COMBINED HOMERUN AND BRANCH CIRCUIT TO BE MINIMUM #10 WIRE (3/4").
- 120 VOLT BRANCH CIRCUITS, WHERE THE LENGTH OF CIRCUIT CONDUCTORS COMPLETE FROM CIRCUIT BREAKER IN SOURCE PANEL TO ANY DEVICE ON THE CIRCUIT IS 126-160 FEET, ARE TO HAVE #10 MINIMUM BRANCH CIRCUIT WIRING THROUGHOUT CIRCUIT (3/4").
- 120 VOLT BRANCH CIRCUITS, WHERE THE LENGTH OF CIRCUIT CONDUCTORS COMPLETE FROM CIRCUIT BREAKER IN SOURCE PANEL TO ANY DEVICE ON THE CIRCUIT IS 161-205 FEET, ARE TO HAVE #8 MINIMUM BRANCH CIRCUIT WIRING HOMERUN (1") FROM PANEL CIRCUIT BREAKER TO FIRST DEVICE AND #10 BRANCH CIRCUIT WIRING THROUGHOUT THE REMAINDER OF THE CIRCUIT (3/4"). NOT LESS THAN THE FIRST 125 FEET OF COMBINED HOMERUN AND BRANCH CIRCUIT TO BE MINIMUM #8 WIRE (1").
- 120 VOLT BRANCH CIRCUITS SERVING RECEPTACLES FOR COMPUTER WORKSTATIONS (IE OUTLETS WITH 'C' DESIGNATION) SHALL HAVE MINIMUM CONDUCTOR SIZE OF #10. #10 MINIMUM CONDUCTOR SIZE SHALL BE INCREASED IF REQUIRED TO COMPLY WITH GENERAL NOTES ABOVE.
- ALL 277V, 20A CIRCUITS WITH HOMERUNS LESS THAN 70 FEET SHALL BE #12 CU. MINIMUM THROUGHOUT CIRCUIT UNLESS OTHERWISE NOTED (CONDUIT SIZE PER SPECIFICATION AND NEC). THE HOMERUN LENGTH IS THE LENGTH OF THE CIRCUIT CONDUCTORS FROM THE FIRST LIGHT FIXTURE/LOAD TO THE BREAKER IN THE SOURCE PANEL.
- ALL 277V, 20A CIRCUITS WITH HOMERUNS 71-100 FEET SHALL BE #10 CU. MINIMUM FOR HOMERUN (3/4"), WITH #12 FOR REMAINDER OF CIRCUIT UNLESS OTHERWISE NOTED (CONDUIT SIZE PER SPECIFICATION AND NEC). THE HOMERUN LENGTH IS THE LENGTH OF THE CIRCUIT CONDUCTORS FROM THE FIRST LIGHT FIXTURE/LOAD TO THE BREAKER IN THE SOURCE PANEL.
- ALL 277V, 20A CIRCUITS WITH HOMERUNS 101-150 FEET SHALL BE #10 CU. MINIMUM FOR HOMERUN (3/4"), WITH #10 FOR REMAINDER OF CIRCUIT UNLESS OTHERWISE NOTED (CONDUIT SIZE PER SPECIFICATION AND NEC). THE HOMERUN LENGTH IS THE LENGTH OF THE CIRCUIT CONDUCTORS FROM THE FIRST LIGHT FIXTURE/LOAD TO THE BREAKER IN THE SOURCE PANEL.
- ALL 277V, 20A CIRCUITS WITH HOMERUNS 151-250 FEET SHALL BE #8 CU. MINIMUM FOR HOMERUN (1"), WITH #10 FOR REMAINDER OF CIRCUIT UNLESS OTHERWISE NOTED (CONDUIT SIZE PER SPECIFICATION AND NEC). THE HOMERUN LENGTH IS THE LENGTH OF THE CIRCUIT CONDUCTORS FROM THE FIRST LIGHT FIXTURE/LOAD TO THE BREAKER IN THE SOURCE PANEL.
- ALL 277V, 20A CIRCUITS WITH HOMERUNS 251-400 FEET SHALL BE #6 CU. MINIMUM FOR HOMERUN (1-1/4" C.), WITH #10 FOR REMAINDER OF CIRCUIT UNLESS OTHERWISE NOTED (CONDUIT SIZE PER SPECIFICATION AND NEC). THE HOMERUN LENGTH IS THE LENGTH OF THE CIRCUIT CONDUCTORS FROM THE FIRST LIGHT FIXTURE/LOAD TO THE BREAKER IN THE SOURCE PANEL.
- VERIFY EXACT LOCATION OF ALL MECH. EQUIP. INCLUDING WALL SWITCHES, TSTATS, ETC. WITH MECH. CONTRACTOR AND MECH. DRAWINGS.
- REFER TO MECHANICAL EQUIPMENT SCHEDULE, FOR RESPECTIVE CONDUIT/CONDUCTORS, DISCONNECTS, MISC. EQUIPMENT REQUIRED FOR ALL MECHANICAL AND PLUMBING EQUIPMENT.
- REFER TO PANEL SCHEDULES FOR CIRCUITS NUMBERS OF CIRCUITS FOR MECHANICAL AND PLUMBING EQUIPMENT.
- VISIT AND CAREFULLY EXAMINE THOSE PORTIONS OF THE BUILDING AND SITE AFFECTED BY THIS WORK BEFORE SUBMITTING PROPOSALS, SO AS TO BECOME FAMILIAR WITH EXISTING CONDITIONS AND DIFFICULTIES THAT WILL AFFECT EXECUTION OF THE WORK. SUBMISSION OF A PROPOSAL WILL BE CONSTRUED AS EVIDENCE THAT SUCH EXAMINATION HAS BEEN MADE AND LATER CLAIMS FOR LABOR, EQUIPMENT OR MATERIALS REQUIRED BECAUSE OF DIFFICULTIES ENCOUNTERED WILL NOT BE RECOGNIZED.
- READ SPECIFICATIONS.
- SEE RISER DIAGRAMS AND BUILDING PLANS.
- ALL EMPTY CONDUITS ARE TO HAVE PULL-STRINGS PROVIDED IN THEM.
- WHERE CONDUIT ROUTING IS SHOWN, THE CONDUITS ARE SHOWN FOR DIAGRAMMATIC PURPOSES AND ARE NOT NECESSARILY REPRESENTATIVE OF EXACT PLACEMENT. THE ROUTINGS SHOWN ARE PROPOSED CONDUIT ROUTINGS. CONTRACTOR TO COORDINATE ALL ROUTING WITH OTHER TRADES PRIOR TO BID. CONTRACTOR TO FIELD VERIFY EXISTING CONDITIONS AND ROUTING OF CONDUIT PRIOR TO BID. CONTRACTOR IS RESPONSIBLE FOR RELOCATING CONDUIT FROM THE PROPOSED ROUTING SHOWN TO THE ROUTING REQUIRED TO FACILITATE INSTALLATION PER SPECIFICATIONS AND APPLICABLE CODES. COMPLETE WITH ALL COORDINATION AND EXISTING CONDITIONS TAKEN INTO ACCOUNT. CONTRACTOR IS RESPONSIBLE FOR ALL CEILING AND WALL REPAIR/REPLACEMENT AFTER ROUTING OF CONDUIT.
- ALL CONDUIT TERMINATIONS AT TERMINAL BOARDS ARE TO HAVE BUSHED CONDUIT ENDS.
- CONTRACTOR SHALL INCLUDE IN HIS BID THE TRANSPORT AND DISPOSAL OR RECYCLING OF ALL WASTE MATERIALS GENERATED BY THIS PROJECT IN ACCORDANCE WITH ALL RULES, REGULATIONS AND GUIDELINES APPLICABLE. CONTRACTOR SHALL COMPLY FULLY WITH FLORIDA STATUTE 403.7186 REGARDING MERCURY CONTAINING DEVICES AND LAMPS. LAMPS, BALLASTS AND OTHER MATERIALS SHALL BE TRANSPORTED AND DISPOSED OF IN ACCORDANCE WITH ALL DEP AND EPA GUIDELINES APPLICABLE AT TIME OF DISPOSAL. CONTRACTOR SHALL PROVIDE OWNER WITH WRITTEN CERTIFICATION OF ACCEPTED DISPOSAL.
- MOUNT ALL DISCONNECT SWITCHES FOR MECHANICAL EQUIPMENT WITHIN 8 FT. OF EQUIPMENT CONNECTION POINT. VERIFY LOCATION OF POINT OF CONNECTION WITH EQUIPMENT INSTALLER PRIOR TO ELECTRICAL ROUGH-IN. (DRAWINGS ONLY SHOW DIAGRAMMATIC LOCATION OF CONNECTION).
- EXISTING CONDITIONS AND UTILITIES INDICATED ARE TAKEN FROM EXISTING CONSTRUCTION DOCUMENTS, VARIOUS SURVEYS, AND FIELD INVESTIGATIONS. IT IS TO BE UNDERSTOOD THAT UNFORESEEN CONDITIONS PROBABLY EXIST AND NEW WORK MAY NOT BE FIELD LOCATED EXACTLY AS SHOWN ON THE DRAWINGS. COOPERATION WITH OTHER TRADES IN ROUTING AND/OR BURIAL DEPTHS AS DETERMINED DURING CONSTRUCTION AND AS DIRECTED BY THE ARCHITECT/ENGINEER MAY BE NECESSARY AND IT IS INTENDED THAT SUCH DEVIATIONS SHALL BE CONSIDERED A PART OF THIS CONTRACT. IT IS ALSO UNDERSTOOD THAT THE PLANS ARE NOT COMPLETELY TO SCALE. THIS CONTRACTOR IS TO FIELD VERIFY DIMENSIONS OF ALL SITE UTILITIES, ETC., PRIOR TO BID AND INCLUDE ANY DEVIATIONS IN THE CONTRACT.
- IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO LOCATE ALL EXISTING UTILITIES WHETHER SHOWN ON PLANS OR NOT AND TO PROTECT THEM FROM DAMAGE. THE CONTRACTOR SHALL BEAR ALL EXPENSE FOR REPAIR OR REPLACEMENT OF UTILITIES OR OTHER PROPERTY DAMAGED BY OPERATIONS IN CONJUNCTION WITH THE COMPLETION OF THIS WORK. THE CONTRACTOR SHALL LOCATE ALL UTILITIES (BOTH KNOWN AND UNKNOWN) IN AREA OF WORK PRIOR TO EXCAVATION WITH THE USE OF ELECTRONIC LOCATOR/TRACER DEVICES AND EQUIPMENT SUITABLE FOR SUCH USE. REFLECT LOCATED UTILITIES ON AS-BUILT DOCUMENTS.
- ALL EXISTING ELECTRICAL IS NOT SHOWN. IT IS THE CONTRACTORS RESPONSIBILITY TO BECOME FAMILIAR WITH ALL EXISTING CONDITIONS PRIOR TO BID, AND INCLUDE IN HIS BID THE REMOVAL OF ALL ELECTRICAL EQUIPMENT, WIRE, CONDUIT, DEVICES, FIXTURES, ETC. THAT IS NOT BEING REUSED, BACK TO ITS SOURCE.
- ALL CONDUIT TO BE CONCEALED UNLESS IMPOSSIBLE DUE TO EXISTING CONDITIONS (I.E. EXPOSED CEILINGS, BUILDING EXTERIOR WALL RUNS, IMPOSSIBLE UNDERGROUND RUNS). CONCEAL ALL CONDUITS ABOVE CEILINGS OR IN WALL COUNTERS.
- ALL NEW DEVICES TO BE FLUSH MOUNTED UNLESS SPECIFICALLY NOTED OTHERWISE.
- ELECTRICAL CONTRACTOR SHALL INCLUDE ALL EXISTING PANELBOARD SCHEDULES FOR PANELBOARDS RELATED/ASSOCIATED WITH OR WITHIN CONTRACT LIMITS WHETHER SHOWN ON PLANS OR NOT AS PART OF A COMPLETE AS-BUILT SET OF DRAWINGS. SCHEDULES SHALL SHOW FINAL CONFIGURATION, ETC. OF CIRCUITS, CIRCUIT BREAKERS, DIRECTORY, ETC.
- ALL EXISTING BRANCH CIRCUITS AND FEEDERS (REMAINING ACTIVE) WHICH ARE CONNECTED TO EXISTING PANELBOARDS THAT ARE AFFECTED BY THIS CONTRACT, SHALL BE TRACED-OUT AND PROPERLY NOTED AND IDENTIFIED ON NEW PANEL DIRECTORIES.
- ALL PANELS, CIRCUIT BREAKERS, JUNCTION BOXES, ETC. THAT ARE WITHIN AREA OF REMODEL SHALL BE PROPERLY IDENTIFIED AS PER SPECIFICATIONS.
- ALL EXISTING CONDUIT, WIRE, FITTINGS, BOXES, ETC. REMAINING AND/OR UTILIZED WITHIN AREA OF REMODEL/RENOVATION MUST COMPLY WITH SPECIFICATIONS. ELECTRICAL COMPONENTS WHICH DO NOT COMPLY WITH SPECIFICATIONS, AND IS NOT IN COMPLIANCE WITH NATIONAL ELECTRICAL CODE AND LOCAL CODES SHALL BE REPLACED AND/OR REWORKED AT NO ADDITIONAL COST TO OWNER UNDER THIS CONTRACT (I.E. CONDUIT SIZING, ROUTING, SUPPORTS, ETC.).
- PROVIDE NEW TYPED PANEL DIRECTORIES FOR ALL EXISTING AND NEW PANELBOARDS FOR PANELBOARDS ASSOCIATED WITH CONTRACT WHETHER SHOWN ON PLANS OR NOT REGARDLESS IF SCHEDULES/CIRCUITRY HAS BEEN CHANGED.
- PROVIDE NEW PHENOLIC LABELS (PER SPECS) ON ALL (2) TWO POLE AND (3) THREE POLE CIRCUIT BREAKERS WITHIN ALL EXISTING AND NEW PANELBOARDS ASSOCIATED WITH CONTRACT WHETHER SHOWN ON PLANS OR NOT REGARDLESS IF SCHEDULES/CIRCUITRY HAS BEEN CHANGED.
- ALL EXISTING AND NEW CIRCUIT BREAKERS WITHIN EACH EXISTING PANELBOARD SHALL BE THE SAME MFG. TYPE, STYLE AND A.I.C. RATING OF EXISTING PANELBOARD REGARDLESS OF WHAT IS SHOWN ON PANEL SCHEDULE. FIELD VERIFY ALL EXISTING PANELBOARD(S) RELATED WITH CONTRACT AND REPLACE CIRCUIT BREAKERS AS NECESSARY TO COMPLY WITH THIS REQUIREMENT.
- ALL CONCRETE, WALL PATCHING, CEILING REPAIR, WALL FINISHES, AND OTHER GENERAL WORK REQUIRED FOR INSTALLING ELECTRICAL SYSTEMS SHALL BE REPAIRED TO LIKE NEW/ORIGINAL CONDITION. (COORDINATE WITH GENERAL CONTRACTOR PRIOR TO BID.)
- ALL PATCHES OR CEILING PLATES SHALL BE PATCHED OR PAINTED AS DIRECTED BY ARCHITECT.
- PAINT ALL EXPOSED CONDUIT, BOXES, ETC. TO MATCH WALL SURFACE.
- ALL OPENINGS IN FIRE RATED WALLS AND FLOORS, ETC. MADE BY RENOVATION SHALL BE SEALED AND FIREPROOFED. PROVIDE AND INSTALL FIRESTOPPING ON ALL NEW OR EXISTING CONDUIT AND/OR CABLE THAT PENETRATES ANY FIRE RATED NEW OR EXISTING WALL IN ALL AREAS AFFECTED BY THIS PROJECT. VERIFY LOCATION OF FIRE RATED WALLS WITH ARCHITECTURAL PLANS PRIOR TO BID. FIRESTOPPING SYSTEM SHALL BE AS REQUIRED BY IUL FOR RATING OF WALL AND CONDUIT/CABLE PENETRATION.
- WORK TO BE PERFORMED IN STRICT COMPLIANCE WITH ESTABLISHED WORK SCHEDULE BEING SET FORTH BY OWNERTENANT. COORDINATE ALL WORK. THE CONTRACTOR SHALL FURNISH ADEQUATE FORCES, CONSTRUCTION PLANT, AND EQUIPMENT, AND SHALL WORK SUCH HOURS, INCLUDING NIGHT SHIFTS, OVERTIME OPERATIONS, SUNDAY, AND HOLIDAYS IN ACCORDANCE WITH THE OWNERS OPERATIONAL SCHEDULE. IF THE CONTRACTOR FALLS BEHIND PROGRESS REQUIRED IN THE OPERATIONAL SCHEDULE, THE CONTRACTOR SHALL TAKE SUCH STEPS AS MAY BE NECESSARY TO IMPROVE HIS PROGRESS, AND THE OWNER MAY REQUIRE HIM TO INCREASE THE NUMBER OF SHIFTS AND/OR OVERTIME OPERATIONS, DAY OF WORK AND/OR THE AMOUNT OF CONSTRUCTION PLANT, AT NO ADDITIONAL COST TO THE OWNER UNDER THIS CONTRACT. (IT SHALL BE UNDERSTOOD THAT SEVERAL BID PACKAGES MAY BE CONSTRUCTED BY VARIOUS CONTRACTOR/SUB-CONTRACTORS WITHIN THE SAME WORK SPACE.

SYMBOL LEGEND					
SYMBOL	DESCRIPTION	DESIGN SELECTION	APPROVED SUBSTITUTION	APPROVED SUBSTITUTION	REMARKS
☐	CONTROL AND/OR POWER CONNECTION ON EQUIPMENT				i
\$M	OUTLET BOX AND 20 AMP, 1P MANUAL MOTOR CONTROLLER WITHOUT OVERLOADS. RATED 1 HP @ 120V, 2 HP @ 277V.	P&S #PS20AC1	HUBBELL #HBL1221		d
\$2M	OUTLET BOX AND 20 AMP, 2P MANUAL MOTOR CONTROLLER WITHOUT OVERLOADS. RATED 2 HP @ 240V.	P&S #PS20AC2	HUBBELL #HBL1222		d
\$M3	OUTLET BOX AND 30 AMP, 3P MANUAL MOTOR CONTROLLER WITHOUT OVERLOADS. RATED 7.5 HP @ 240V, 10 HP @ 480V.	P&S #7803/7801	HUBBELL #HBL7810DLOCK BRACKET	LEVITON #7810LOCK BRACKET	d

NOTES:

- ALL DEVICES TO BE GRAY WITH SMOOTH METAL #302 S.S. PLATES UNLESS OTHERWISE NOTED.
- DASHED ITEM DENOTES EXISTING.
- "R" BY DEVICE DENOTES EXISTING TO BE REMOVED COMPLETELY.
- "H" BY DEVICE DENOTES DEVICE TO BE MOUNTED HORIZONTALLY.
- MOUNT SWITCHES AT 48" AFF TO TOP.
- SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
- ALL ITEMS NOTED ON THE LEGENDS DO NOT NECESSARILY APPEAR ON PLANS.

REMARKS:

- JUNCTION/OUTLET BOX SHALL BE SIZED AS REQUIRED FOR CONDUCTOR/DEVICE FILL PER N.E.C.

- MAINTAIN WORKING CLEARANCES IN STRICT ACCORDANCE WITH N.E.C. COORDINATE EXACT LOCATION OF EQUIPMENT WITH ALL DISCIPLINES (I.E. STRUCTURAL, HVAC, PLUMBING, FIRE PROTECTION, KITCHEN, MILLWORK, ETC.) PRIOR TO ROUGH-IN TO MAINTAIN CLEARANCES.

REVISIONS

CITY HALL HVAC UPGRADE
CITY OF TAVARES
 201 E. MAIN STREET
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BID DOCUMENTS



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GEN NTS, SYMBOL LEGEND
E001
 ISSUE DATE 10/26/16

JOB #: GC-16-043
 10/26/2016 2:21:03 PM

ELECTRICAL SHEET LIST	
SHEET NUMBER	SHEET NAME
E001	GEN NTS, SYMBOL LEGEND
E101	PHASE I - SITE PLAN - POWER
E111	PHASE I - FLOOR PLAN - POWER
E201	PHASE II - SITE PLAN - POWER
E211	PHASE II - FLOOR PLAN - POWER
E601	PANEL SCHEDULES
E602	FEEDER SCHEDULE



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 MPE JOB #: 2016-166

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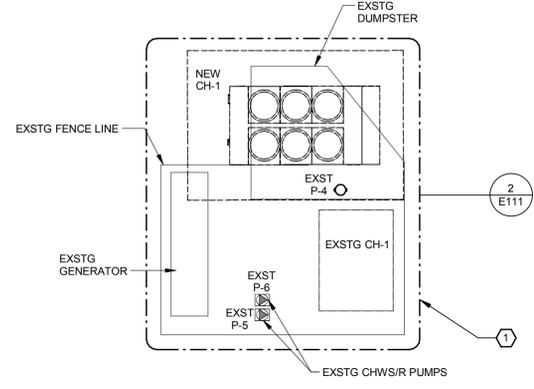
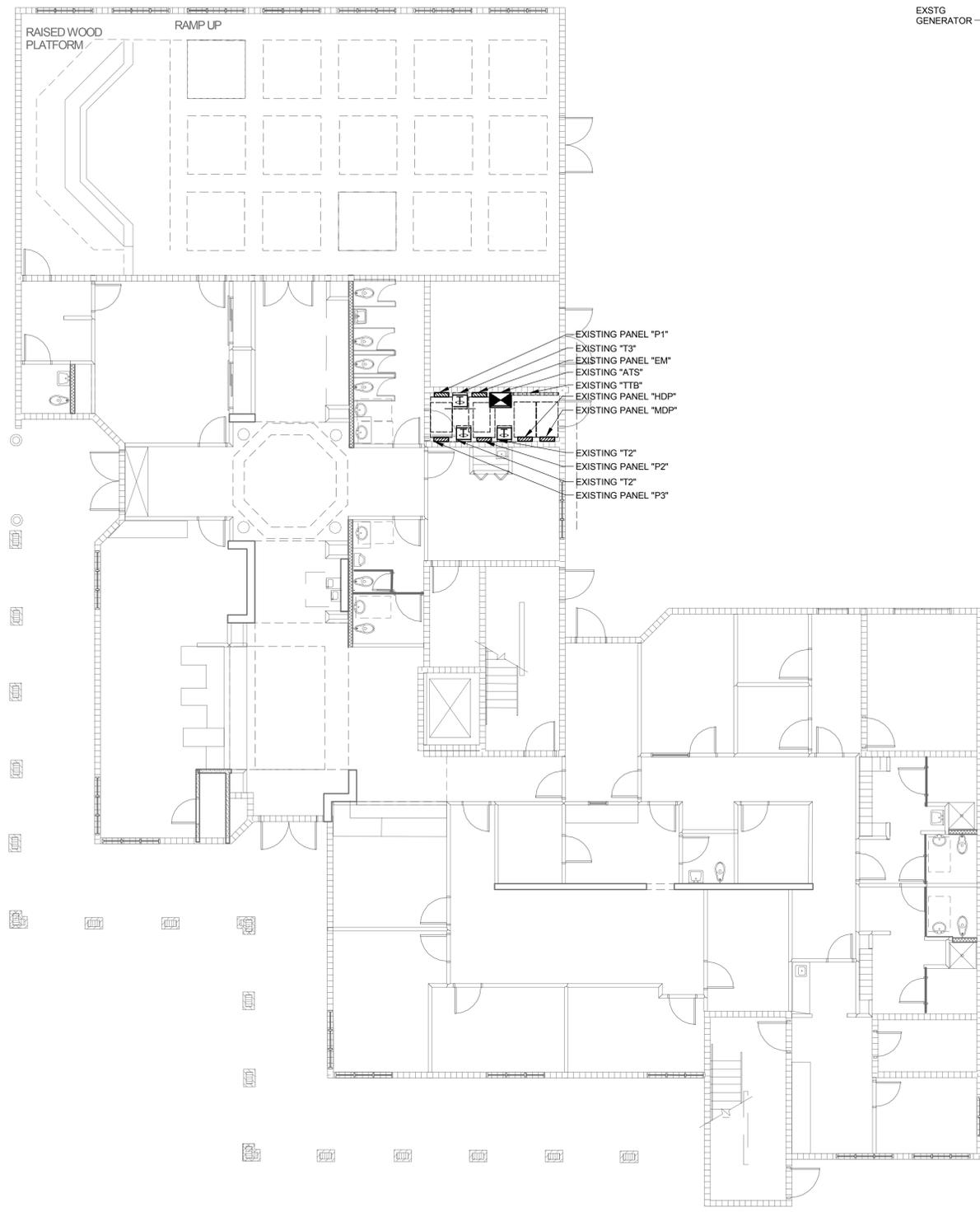
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GENERAL NOTES:

1. REFER TO GENERAL NOTES FOR THIS DISCIPLINE.
2. REFER TO SPECIFICATIONS.
3. ALL HEX NOTES NOT NECESSARILY USED ON ALL SHEETS.

HEX NOTES:

- 1 REFER TO MECHANICAL SHEET M101 FOR ADDITIONAL REQUIREMENTS.

1 PHASE I - SITE PLAN - POWER
1/8" = 1'-0"

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NO.	DATE	REVISIONS

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PHASE I - SITE PLAN - POWER

E101
ISSUE DATE 10/26/16

JOB #: GC-16-043
10/26/2016 2:21:05 PM

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GENERAL NOTES:

- REFER TO GENERAL NOTES FOR THIS DISCIPLINE.
- REFER TO SPECIFICATIONS.
- ALL HEX NOTES NOT NECESSARILY USED ON ALL SHEETS.

HEX NOTES:

- EXISTING VAV-BOX TO BE REMOVED. SEE MECHANICAL DRAWING M111. DISCONNECT EXISTING ELECTRICAL AND PREPARE FOR CONNECTION OF NEW EQUIPMENT. REFER TO E211 FOR NEW CONNECTION REQUIREMENTS.
- EXISTING AHU-4 TO BE REMOVED. SEE MECHANICAL DRAWING M111. DISCONNECT EXISTING ELECTRICAL AND PREPARE FOR CONNECTION OF NEW EQUIPMENT. REFER TO E211 FOR NEW CONNECTION REQUIREMENTS.
- NEW CH-1 REFER TO MECHANICAL SHEET M111.
- EXISTING CH-1 AND ALL ASSOCIATED ELECTRICAL EQUIPMENT TO REMAIN OPERATIONAL UNTIL SWITCH OVER TO NEW CHILLER IN PHASE 2. REFER TO E211 AND M211.
- EXISTING GENERATOR TO REMAIN.
- OWNER TO RELOCATE DUMPSTER AND ENCLOSURE TO NEW LOCATION. PRIOR TO CONSTRUCTION
- REFER TO MECHANICAL SHEET M111.

NO.	DESCRIPTION	DATE

CITY HALL HVAC UPGRADE
CITY OF TAVARES
 201 E. MAIN STREET
 TAVARES, FLORIDA, 32778

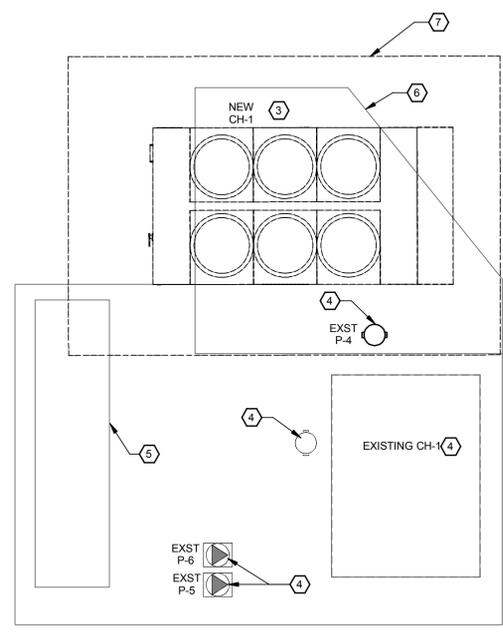
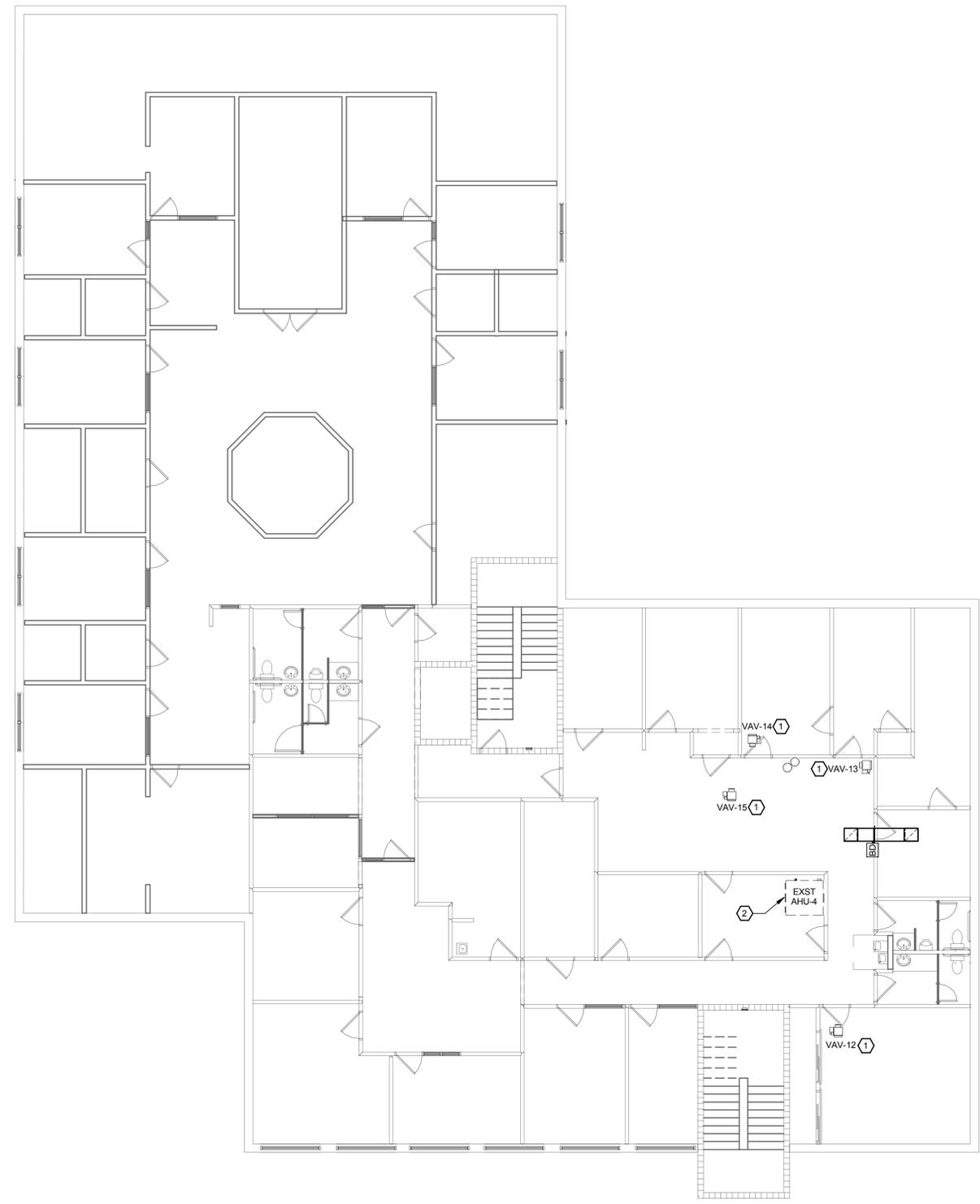
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PHASE I - FLOOR PLAN - POWER
E111
 ISSUE DATE 10/26/16
 JOB #: GC-16-043
 10/26/2016 2:21:08 PM



① PHASE I - FLOOR PLAN - POWER
 1/8" = 1'-0"

② PHASE I - ENLARGED PLAN - CHILLER YARD - POWER
 1/4" = 1'-0"

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 MPE JOB #. 2016-166

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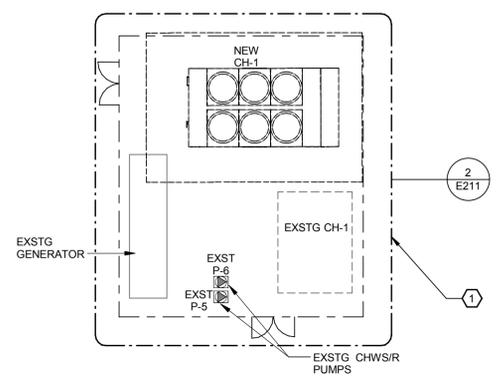
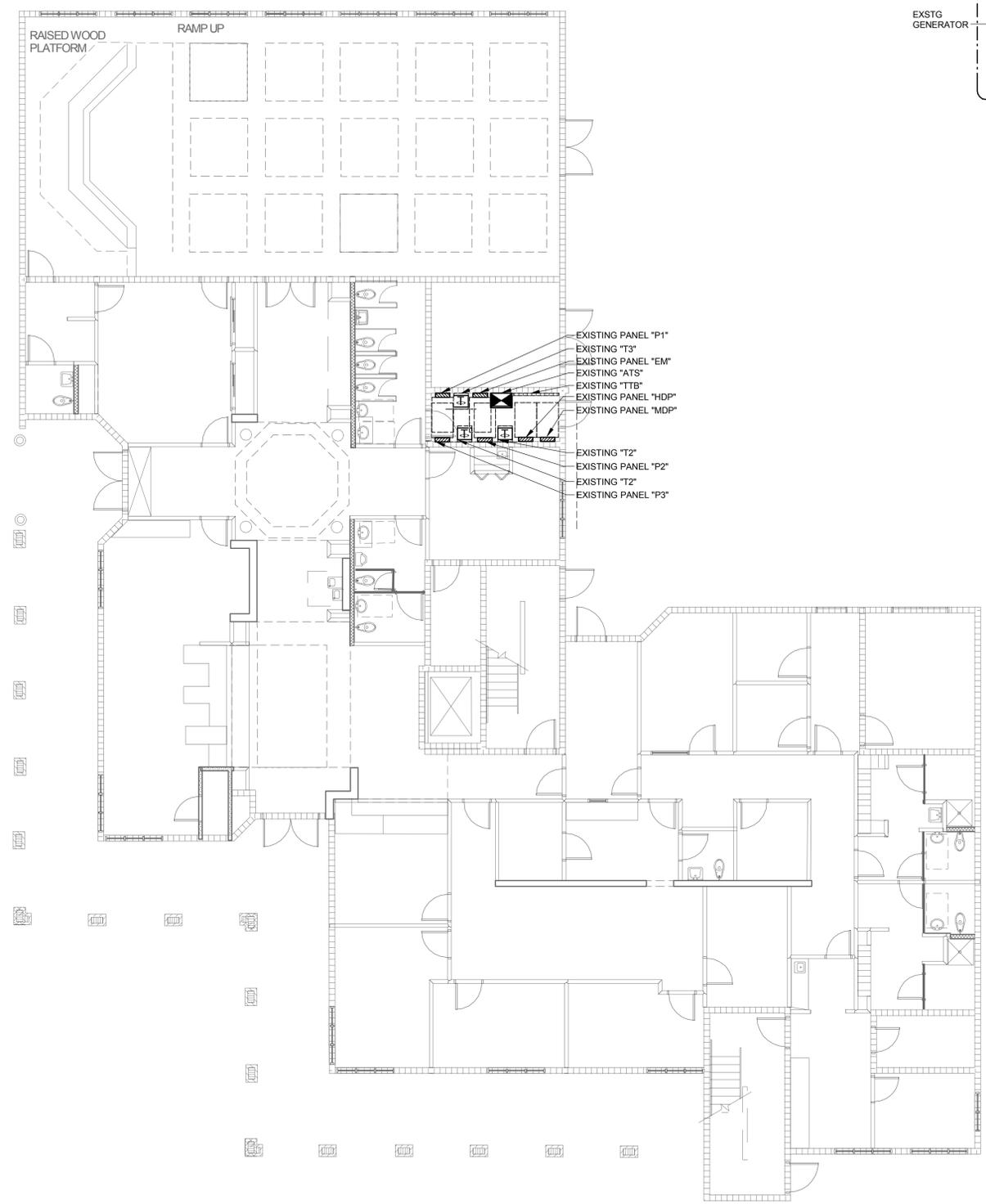
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GENERAL NOTES:

- 1. REFER TO GENERAL NOTES FOR THIS DISCIPLINE.
- 2. REFER TO SPECIFICATIONS.
- 3. ALL HEX NOTES NOT NECESSARILY USED ON ALL SHEETS.

HEX NOTES:

- 1 REFER TO MECHANICAL SHEET M201. FOR ADDITIONAL REQUIREMENTS.

REVISIONS

CITY HALL HVAC UPGRADE
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PHASE II - SITE
 PLAN - POWER

E201
 ISSUE DATE 10/26/16

JOB #: GC-16-043
 10/26/2016 2:21:10 PM

1 PHASE II - SITE PLAN - POWER
 1/8" = 1'-0"

mp MATERN PROFESSIONAL ENGINEERING, INC.
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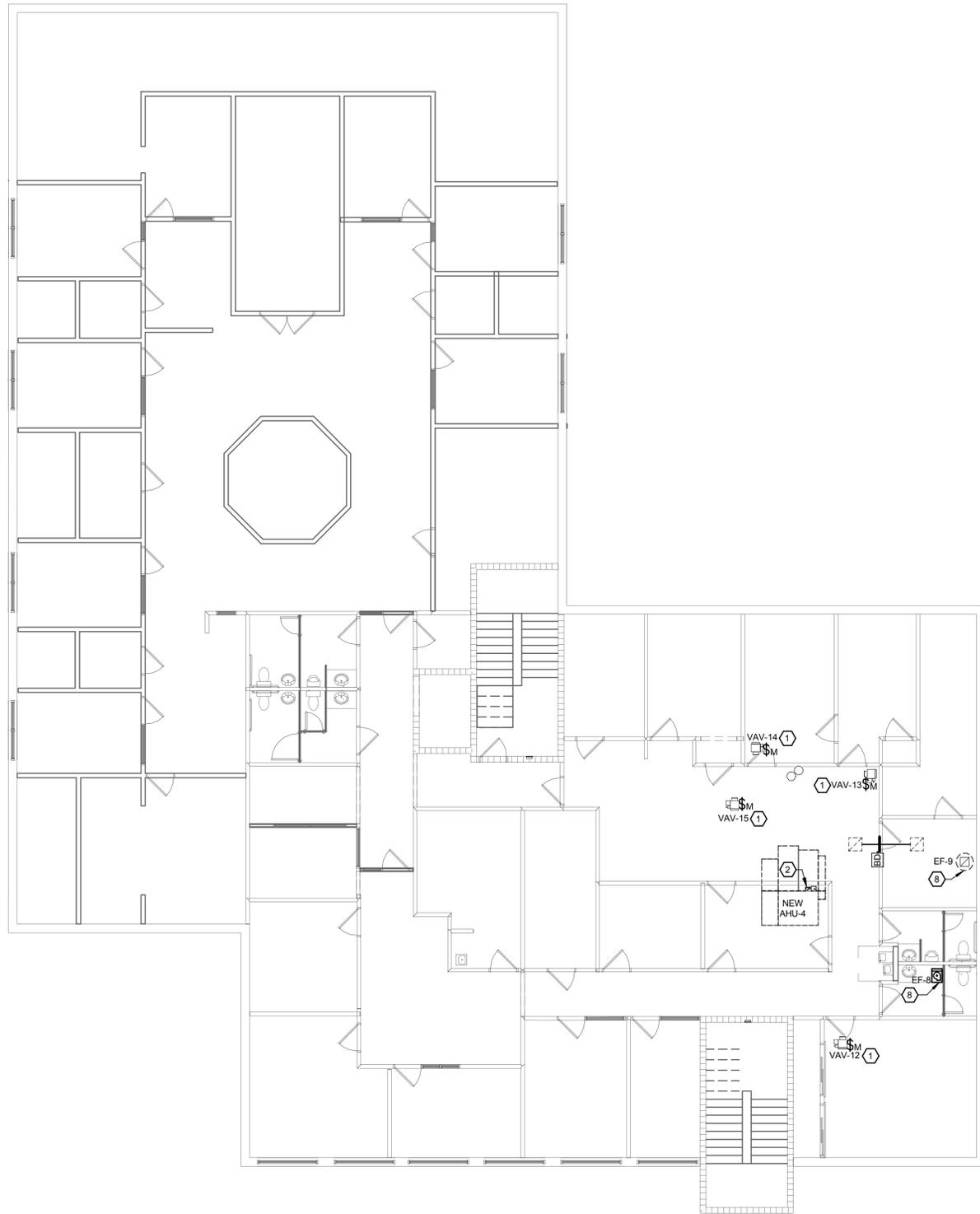
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① PHASE II - FLOOR PLAN - POWER
1/8" = 1'-0"

GENERAL NOTES:

1. REFER TO GENERAL NOTES FOR THIS DISCIPLINE.
2. REFER TO SPECIFICATIONS.
3. ALL HEX NOTES NOT NECESSARILY USED ON ALL SHEETS.

HEX NOTES:

1. NEW VAV-BOX TO BE RECONNECTED TO EXISTING ELECTRICAL PANEL "EM" REFER TO ELECTRICAL SHEET E602 FOR FEEDER SCHEDULES.
2. NEW AHU-4 TO BE RECONNECTED TO EXISTING ELECTRICAL PANEL "EM" REFER TO ELECTRICAL SHEET E602 FOR FEEDER SCHEDULES.
3. NEW 150AMP DISCONNECT PROVIDED BY THE CH-1 MANUFACTURER AND TO BE CONNECTED BACK TO EXISTING ELECTRICAL "MDP", CIRCUIT MDP-14:16:18, PROVIDE NEW CIRCUIT BREAKER WITH CONDUCTORS AND CONDUITS. SEE MECHANICAL EQUIPMENT FEEDER SCHEDULES ON SHEET E602 AND MECHANICAL SHEET M601 FOR SPECIFICATIONS.
4. EXISTING CH-1 WITH ALL ASSOCIATED ELECTRICAL EQUIPMENT TO BE REMOVED. SEE MECHANICAL DRAWING M111. REMOVE ALL ELECTRICAL WIRING BACK TO SOURCE MARK FEEDER BREAKERS AS SPARE AND SWITCH TO OFF POSITION. COORDINATE WITH MECHANICAL EQUIPMENT IS TO REMAIN TILL PHASE II.
5. EXISTING GENERATOR TO REMAIN.
6. CONNECTION FOR HEAT TAPE REFER TO CH-1 MANUFACTURE'S INSTALLATION REQUIREMENTS. FOR EXACT LOCATION AND SPECIFICATION PRIOR TO ROUGH-IN.
7. REFER TO MECHANICAL SHEET M211 FOR SPECIFICATIONS
8. NEW EF-8 AND EF-9 TO BE RECONNECTED TO EXISTING ELECTRICAL PANEL "P1" REFER TO ELECTRICAL SHEET E602 FOR FEEDER SCHEDULES AND ELECTRICAL PANEL.

REVISIONS

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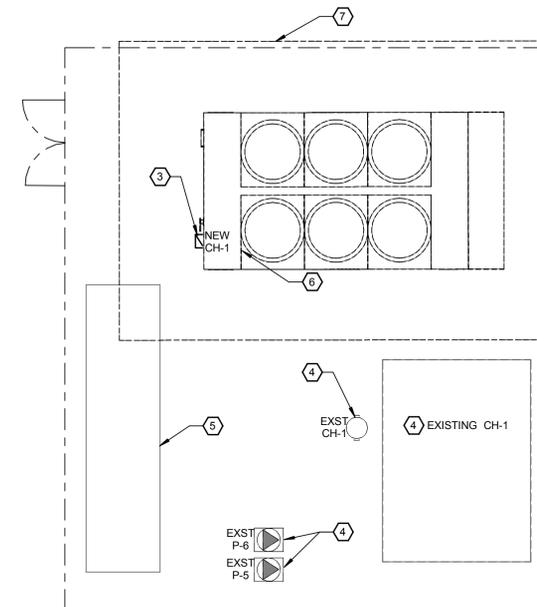
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PHASE II -
FLOOR PLAN -
POWER
E211
ISSUE
DATE 10/26/16

JOB #: GC-16-043
10/26/2016 2:21:11 PM



② PHASE II - ENLARGED PLAN - CHILLER YARD - POWER
1/4" = 1'-0"

mp MATERN
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MPE JOB #: 2016-166

MECHANICAL/KITCHEN EQUIPMENT FEEDER SCHEDULE FOR (8): TAVARES, FLORIDA 2016-166

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EQUIPMENT DESCRIPTION	VOLTS	PH	NEUTRAL Y/N	LARGEST MOTOR HP	FLA	LRA	COMPRESSOR FLA(1)	LRA	ADD'L MOTORS FLA	LRA	HEAT STRIPS KW	AMPS	MISC AMPS	TOTAL FLA	MCA (10)	MOCF (10)	PANEL CB (5)	DISCONNECT SWITCH CODE	SIZE (1)	FUSE (2)	TYPE (3)	STARTER CODE	TYPE	WIRE PER PHASE (6)	NEUTRAL WIRE (7)	GROUND WIRE	WIRE MATERIAL	# OF RUNS	CONDUIT SIZE	% VD	NOTES (SEE BELOW)
CH-1	480	3	N				24	145			56.4	67.8		92	140	150	150	1	200	NF	3R			#10	#6	#6	COPPER	1	1.50	0.52	10
HEAT TAPE	120	1	Y				20	120						20	40	40	40				3R			#6	#6	#6	COPPER	1	0.75	1.80	10
AHU-4 2ND FLOOR SOUTH	480	3	N	3.00	4.8	32.0								5			15	3			I			#12	#12	#12	COPPER	1	0.50		C
VAV-12	277	1	Y								3.0	10.8		11			15	3	MMS	-	I			#12	#12	#12	COPPER	1	0.50	1.22	
VAV-13	277	1	Y								2.5	9.0		9			15	3	MMS	-	I			#12	#12	#12	COPPER	1	0.50	0.68	
VAV-14	277	1	Y								3.5	12.6		13			20	3	MMS	-	I			#12	#12	#12	COPPER	1	0.50	0.95	
VAV-15	277	1	Y								2.0	7.2		7			15	3	MMS	-	I			#12	#12	#12	COPPER	1	0.50	0.54	
EF-8	120	1	Y	0.17	4.4	26.4								4			15							#12	#12	#12	COPPER	1	0.50	0.38	
EF-9	120	1	Y	0.25	5.8	34.8								6			15				3R			#12	#12	#12	COPPER	1	0.50	0.50	

(1) PROVIDE DISC SW AT ALL PIECES OF EQUIPMENT AS REQUIRED BY THE N.E.C. AND AHJ UNLESS PROVIDED BY OTHERS (INCLUDING AT MOTORS AND AT STARTERS).

(2) FUSES SHOWN FOR REFERENCE ONLY. PROVIDE FUSES AS RECOMMENDED BY EQUIPMENT MANUFACTURER.

(3) PROVIDE NEMA OUTDOOR RATED ENCLOSURES FOR ALL DISC SW'S MOUNTED OUTDOORS.

(4) COORDINATE STARTER TYPE WITH MECH EQUIP INSTALLER.

(5) CONTRACTOR TO VERIFY THAT C.B. FOR COMPRESSORS IS SUFFICIENT TO ALLOW STARTING OF UNIT, IF REQUIRED FOR STARTING C.B. TO BE INCREASED TO A MAX ALLOWED BY N.E.C. CB TO BE HACR RATED.

(6) #12 FEEDERS SHOWN AND OVER 50FT. LONG TO BE #10 FOR 120V CIRCUITS. #12 FEEDERS SHOWN AND OVER 100 FT. LONG TO BE #10 FOR 277 V CIRCUITS.

(7) NEUTRAL CONDUCTOR TO BE SAME SIZE AS PHASE CONDUCTORS.

(8) MOTOR CB IS SIZED BASED ON NEMA CODE 'F' OR HIGHER. CHANGE CB SIZE IF REQUIRED DUE TO NEMA CODE OF MOTOR PER N.E.C.

(9) ALL FEEDERS 100 AMP AND LESS ARE BASED ON 60 DEGREE CONDUCTOR TERMINATION RATING. ALL OTHER FEEDERS ARE BASED ON 75 DEGREE CONDUCTOR TERMINATIONS. PROVIDE AND INSTALL PROPER TERMINATIONS ON ALL EQUIPMENT PROVIDED BY ANY DIVISION AND/OR SECTION OF THE CONTRACT DOCUMENTS. PROPER TERMINATIONS TO BE AS REQUIRED TO MATCH CONDUCTOR WITH REQUIRED AMPACITY.

(10) BASED ON MANUFACTURER'S RECOMMENDATION.

(11) OR BRANCH CIRCUIT SELECTION CURRENT WHEN AVAILABLE.

MCP = MOTOR CIRCUIT PROTECTOR W/COMBINATION STARTER
MMS = MANUAL MOTOR STARTER SWITCH WITH OVERLOADS AND PILOT LIGHT
I = NEMA 1 ENCLOSURE
3R = NEMA 3R ENCLOSURE
4SS = NEMA 4 WATER TIGHT STAINLESS STEEL ENCLOSURE
4 = NEMA 4 WATER TIGHT NON-CORROSIVE ENCLOSURE
VFD/AFD = VARIABLE (ADJUSTABLE-FREQ) FREQ DRIVE UNIT
NF = NON-FUSED, WHERE ACCEPTABLE TO AHJ, CONTRACTOR MAY USE PROPERLY RATED MOTOR SWITCH FOR DISCONNECT SWITCH
AHJ = AUTHORITY HAVING JURISDICTION
FNVR = FULL VOLTAGE NON-REVERSING
DFNVR = DUAL VOLTAGE NON-REVERSING
PVC = FULL VOLTAGE CONTACTOR

(A)=CONNECT VIA LINE VOLTAGE T'STAT BY DIV. 1523 CONTRACTOR.
(B)=CONNECT VIA CONTROL DEVICES BY DIV. 1523 CONTRACTOR.
(C)=CONNECT VIA VFD/AFD WITH INTEGRAL DISC SW.
(D)=CONNECT VIA COMBINATION DISC/STARTER BY DIV. 1523 CONTRACTOR.
(E)=CONNECT VIA DISC SWITCH AT EQUIP. BY DIV. 1523 CONTRACTOR.
(F)=PROVIDE FULL SIZE NEUTRAL.
(G)=MMS WITHOUT OVERLOADS.
(H)=CONNECT VIA STARTER IN MCC (BY DIV 16/26).
(I)=2 SPEED, 1 WINDING MOTOR/STARTER.
(J)=COORDINATE WITH DIV. 16 TO BALANCE LOAD OF 1 PHASE FTB MOTORS.
(K)=PROVIDE NEW STARTER IN MCC TO MATCH EXISTING. SEE MCC SCHED.
(L)=WHERE MOTOR IS FED FROM MCC, PANEL CB NOT REQUIRED
(M)=CONNECT EXIST DISC SWITCH AT MOTOR. MODIFY AS NOTED ON DRWS
(N)=
(O)=
(P)=

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VOLTS L/N: 120
VOLTS PH: 208
PHASE: 3
MOUNTING: SURFACE
TYPE: SQ D
MFR: GFP

EXISTING: YES
SECTIONS: 1
NEMA 3R:

MLQ(****)
MCR
SHTRIP
GFP

NOTES AND REFERENCE NOTES:
SERIES RATED FULLY RATED
AIC RATING: 22 KA
MFR = SIZE CB PER MFR. RECOMMENDATIONS.
S = NEW CB IN EXIST SPACE
& = REPLACE EXIST CB WITH NEW SH + SHUNT TRIP C.B.
AF = ARC FAULT CB

GENERAL NOTES:
(1) ALL C.B.'S FEEDING HVAC EQUIPMENT TO BE HACR TYPE.
(2) ALL C.B.'S FEEDING ELEV EQUIP TO BE SHUNT-TRIP TYPE.
(3) ALL C.B.'S FEEDING ELEV EQUIP TO BE SIZED AS REQ'D BY MFR.
(4) ALL C.B.'S FEEDING HD LYS TO BE HD RATED.
(5) NO MULTIWIRE BRANCH CKTS ARE ALLOWED
(6) NOT USED.

OPTIONAL CALC NO
ACTUAL CONN LOAD 35 KVA 97 AMPS
DEMAND 25 KVA 70 AMPS
DIVERSITY 25 KVA 70 AMPS
TRANSFORMER SIZE KVA

TOTAL AMPS A PH 89
TOTAL AMPS B PH 99
TOTAL AMPS C PH 102
INFO CODE:

WIDTH: 20 DEPTH: 6.00

DESCRIPTION	CONN	TYPE	AMPS	AMPS	AMPS	C.B. POLE	REF NOTE	CKT. NO.	CKT. NO.	REF NOTE	C.B. POLE	C.B. AMPS	AMPS	AMPS	DESCRIPTION	CONN	TYPE
COMMUNICATIONS#11 RM25	5	4.0	8			20	1	2		1	20	9			RECEPS RMS 125-130,134,135	6	4.0
COMMUNICATIONS#11 RM25	5	4.0	8			20	1	3	4	1	20	9			RECEPS RMS 125-130,134,135	6	4.0
COMMUNICATIONS#11 RM25	5	4.0	8			20	1	5	6	1	20	9			RECEPS RMS 136-143	6	4.0
COMMUNICATIONS#11 RM25	5	4.0	8			20	1	7	8	1	20	7			RECEPS RMS 136-143	5	4.0
COMMUNICATIONS#11 RM25	5	4.0	8			20	1	9	10	1	20	10			VENDING MACHINE RM139	10	5.0
SURGE PROT RECEPS RM128	5	4.0	7			20	1	11	12	1	20	15			VENDING MACHINE RM139	10	4.0
S.P. RECEPS RMS 129,132	5	4.0	7			20	1	13	14	1	20	7			RECEPS RMS 214-219,229,231	5	4.0
S.P. RECEPS RMS 129,132	5	4.0	7			20	1	15	16	1	20	7			RECEPS RMS 214-219,229,231	5	4.0
S.P. RECEPS RMS 133,135	5	4.0	7			20	1	17	18	1	20	7			RECEPS RMS 223,226	5	4.0
S.P. RECEPS RMS 142,143	5	4.0	7			20	1	19	20	1	20	6			RECEPS RMS 222-226,217,228	4	4.0
S.P. RECEPS RM 143	5	4.0	7			20	1	21	22	1	20	10			WATER COOLER	10	5.0
S.P. RECEPS RMS 216, 219	5	4.0	7			20	1	23	24	1	20	10			WATER COOLER	10	5.0
S.P. RECEPS RM 217	5	4.0	7			20	1	25	26	1	20	10			HVAC CONTROLS	10	5.0
S.P. RECEPS RM 231	5	4.0	7			20	1	27	28	1	20	4			ELECTRIC DOOR STRIKES	4	5.0
S.P. RECEPS RM 226	5	4.0	7			20	1	29	30	1	20	4			FIRE ALARM (FACP)	4	5.0
EF-8, EF-9	1	5.0	1			20	1	31	32	1	20	4			EF-1, EF-2, EF-3	4	5.0
UNDER COUNTER REFRIG.	10	5.0	10			20	1	33	34	1	20	7			EF-12	7	5.0
UNDER COUNTER REFRIG.	10	5.0	10			20	1	35	36	1	20	6			COURTESY RECEPS (CHILLER PAD)	4	4.0
RECEPTACLE	1	4.0	1			20	1	37	38	1	20	4			CHILLER 2 CONT. CKT.	4	5.0
RECEPTS	1	4.0	1			20	1	39	40	1	20	1			RECEPT	1	4.0
SP-216-219	2	5.0	2			20	1	41	42	1	20	1			S.P. 209-219	1	5.0
SUBFEED LUGS/BREAKER															SUBFEED LUGS/BREAKER		

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VOLTS PH: 208
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MOUNTING: SURFACE
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MFR: GFP

EXISTING: YES
SECTIONS: 1
NEMA 3R:

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OPTIONAL CALC NO
ACTUAL CONN LOAD 35 KVA 97 AMPS
DEMAND 25 KVA 70 AMPS
DIVERSITY 25 KVA 70 AMPS
TRANSFORMER SIZE KVA

TOTAL AMPS A PH 92
TOTAL AMPS B PH 98
TOTAL AMPS C PH 102
INFO CODE:

WIDTH: 20 DEPTH: 6.00

DESCRIPTION	CONN	TYPE	AMPS	AMPS	AMPS	C.B. POLE	REF NOTE	CKT. NO.	CKT. NO.	REF NOTE	C.B. POLE	C.B. AMPS	AMPS	AMPS	DESCRIPTION	CONN	TYPE
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COMMUNICATIONS#11 RM25	5	4.0	8			20	1	5	6	1	20	9			RECEPS RMS 136-143	6	4.0
COMMUNICATIONS#11 RM25	5	4.0	8			20	1	7	8	1	20	7			RECEPS RMS 136-143	5	4.0
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EF-8	4	5.0	4			20	1	31	32	1	20	4			EF-1, EF-2, EF-3	4	5.0
UNDER COUNTER REFRIG.	10	5.0	10			20	1	33	34	1	20	6			EF-9	6	5.0
UNDER COUNTER REFRIG.	10	5.0	10			20	1	35	36	1	20	6			COURTESY RECEPS (CHILLER PAD)	4	4.0
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SUBFEED LUGS/BREAKER															SUBFEED LUGS/BREAKER		

D

C

B

A

REVISIONS

CITY HALL HVAC UPGRADE
CITY OF TAVARES
201 E. MAIN STREET
TAVARES, FLORIDA, 32778

BID
DOCUMENTS

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CORPORATION
1295 B WEST HIGHWAY 50, STE B, CLEMONT, FL 34711
PH: (407)508-5877 FAX: (888)599-4814
Web Site: www.gatorstskch.com

SIGN DATE

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