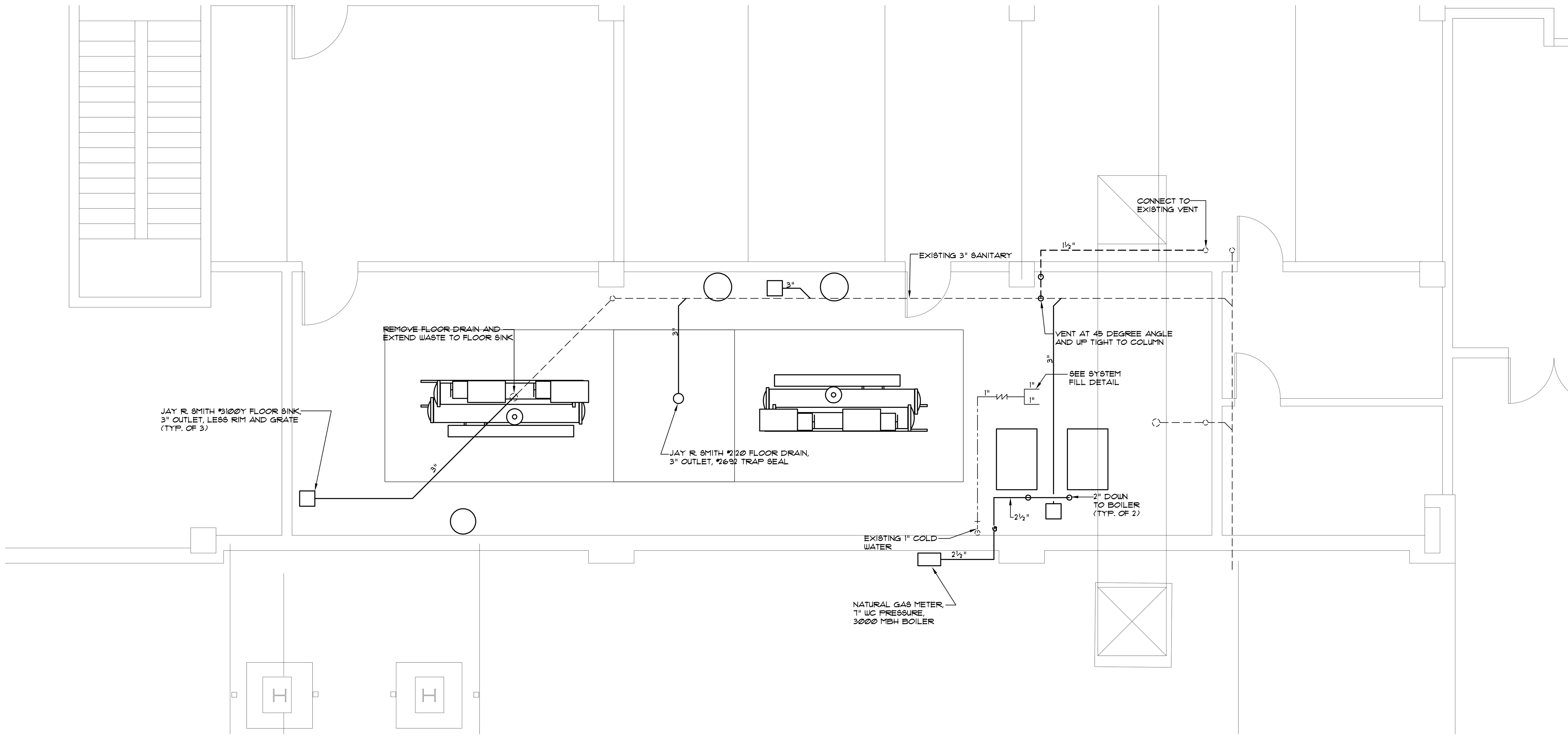
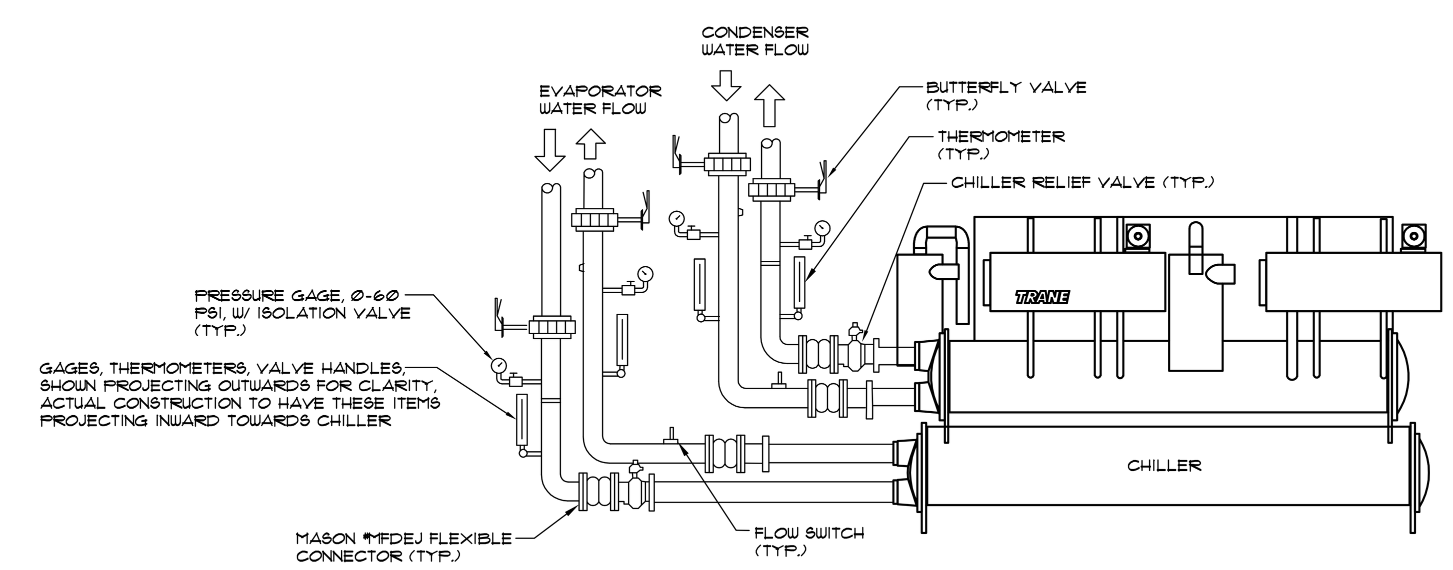


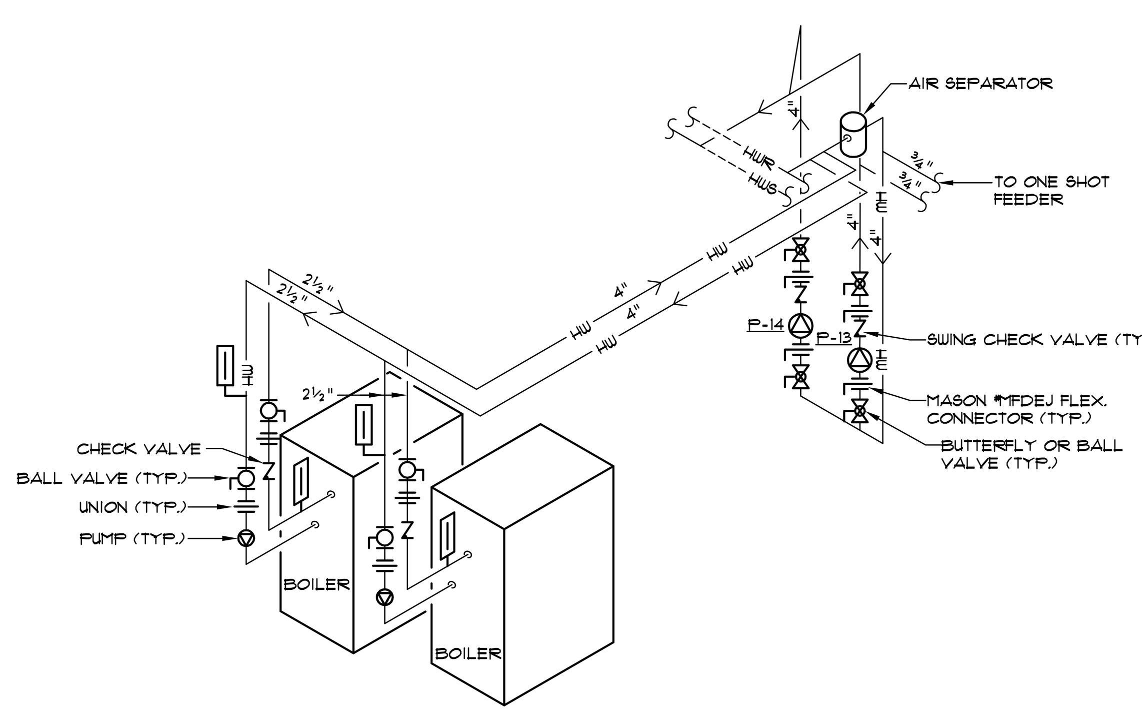
8 M001 GROUND FLOOR MECHANICAL ROOM PLUMBING PLAN
1/4" = 1'-0"

- PIPING OR EQUIPMENT TO BE REMOVED
- EXISTING PIPING OR EQUIPMENT
- DOMESTIC COLD WATER PIPING
- CWS — NEW CHILLED WATER SUPPLY PIPING
- CWR — NEW CHILLED WATER RETURN PIPING
- CWS ---- CWS — EXISTING CHILLED WATER SUPPLY PIPING
- CWR ---- CWR — EXISTING CHILLED WATER RETURN PIPING
- HWS ---- HWS — EXISTING HOT WATER SUPPLY PIPING
- HWR ---- HWR — EXISTING HOT WATER RETURN PIPING
- HW — NEW HOT WATER PIPING
- CW — CONDENSER WATER PIPING
- F — EXISTING FIRE SPRINKLER PIPING
- G — NEW GAS PIPING
- NEW SANITARY PIPING
- NEW SANITARY VENT PIPING

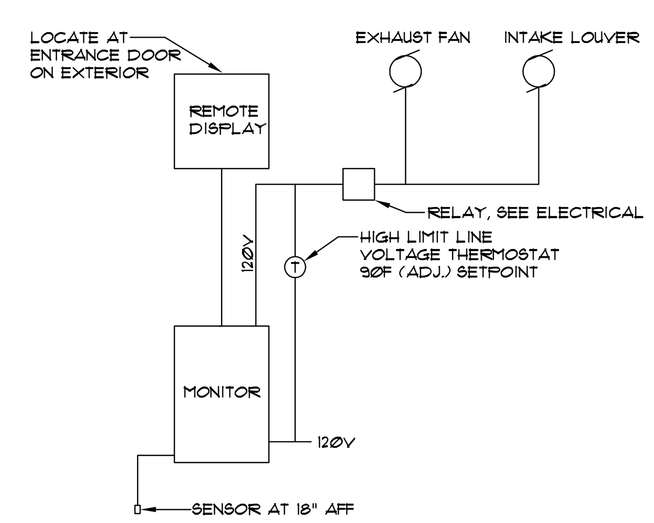
10 M001 HVAC LEGEND
NO SCALE



9 M001 CHILLER PIPING DETAIL
NOT TO SCALE



5 M001 BOILER PIPING RISER
NOT TO SCALE



6 M001 REFRIGERANT MONITOR SCHEMATIC
NOT TO SCALE

CHILLER #1, #2, WATER COOLED CHILLER, TRANE #RTWD, 150 TON NOMINAL CAPACITY, SCREW HIGH EFFICIENCY, 2 PASS EVAPORATOR, 2 PASS CONDENSER, 480V/3/60, 182 MCA, 250 MOP, 0.54 NPLV, 54 EWT, 42 LWT, 300 GPM EVAPORATOR FLOW, 85F CONDENSER EWT, 430 GPM CONDENSER WATER FLOW, ASME PRESSURE VESSEL, LEFT HAND CONDENSER WATER AND EVAPORATOR INLET, INSULATED EVAPORATOR, EVAPORATOR AND CONDENSER FLOW SWITCH, CONTROL SYSTEM BACNET INTERFACE

COOLING TOWER, EVAPCO #USS-19-78L, 155 TON NOMINAL CAPACITY, 450 GPM, 95F EWT, 84.7 LWT, 79F WET BULB, 7.5 HP MOTOR, VARIABLE SPEED DRIVE RATED, 480V/3/60, 6 KW ELECTRIC HEAT, STAINLESS UPPER BASIN, STAINLESS COLD WATER BASIN, EXTERNAL SERVICE PLATFORM, STAINLESS FAN SHAFT, VIBRATION SWITCH, LADDER EXTENSION

P-1, P-2, EXISTING COMPUTER ROOM PUMPS

P-3, P-4, PUMP, TACO #KV4007, 250 GPM AT 50' HEAD, 480V/3/60, 5 HP MOTOR, OPEN DRIP PROOF, PUMP TO BE SUITABLE FOR INSTALLATION IN VERTICAL PIPING, VARIABLE SPEED DRIVE RATED

P-5, P-6, PUMP, TACO #KV4007, 325 GPM AT 40' HEAD, 480V/3/60, 5 HP MOTOR, OPEN DRIP PROOF, PUMP TO BE SUITABLE FOR INSTALLATION IN VERTICAL PIPING, VARIABLE SPEED DRIVE RATED

P-7, P-8, PUMP, TACO #KV3009, 117 GPM AT 45' HEAD, 480V/3/60, 3 HP MOTOR, OPEN DRIP PROOF, PUMP TO BE SUITABLE FOR INSTALLATION IN VERTICAL PIPING, VARIABLE SPEED DRIVE RATED

P-9, P-10, P-11, P-12, PUMP, TACO #KV4075, 300 GPM AT 12' HEAD, 480V/3/60, 1.5 HP MOTOR, OPEN DRIP PROOF, PUMP TO BE SUITABLE FOR INSTALLATION IN VERTICAL PIPING, VARIABLE SPEED DRIVE RATED

P-13, P-14, PUMP, HOT WATER, TACO #KV4009, 264 GPM AT 21' HEAD, 480V/3/60, 2 HP MOTOR, OPEN DRIP PROOF, PUMP TO BE SUITABLE FOR INSTALLATION IN VERTICAL PIPING, VARIABLE SPEED DRIVE RATED

P-15, P-16, PUMP, TACO #TA1229, 450 GPM AT 50' HEAD, 480V/3/60, 7.5 HP MOTOR, TEFC, EXTERIOR INSTALLATION, 2' NPSH, 1160 RPM

CHILLED WATER AIR SEPARATOR, TACO #4906ADH-125, 600 GPM AT 1.6' PRESSURE DROP, INTEGRAL AIR VENT, DIRT SEPARATOR, FLUSH VALVE, BASE RING, 6" INLET AND OUTLET

HOT WATER AIR SEPARATOR, TACO #4904ADH-125, 0.6 PSI PRESSURE DROP AT 260 GPM, INTEGRAL AIR VENT, DIRT SEPARATOR, FLUSH VALVE, 4" INLET AND OUTLET

EXPANSION TANK, TACO #CA140-125

TOWER FILTER, LAKOS #eHTX-320, 450 GPM AT 5 PSI PRESSURE DROP, #EFS-15 PURGE VALVE WITH CONTROLLER, 120V

REFRIGERANT MONITOR, THERMAL GAS SYSTEMS #HALOGUARD MONITOR, 120V, WALL MOUNT, HORN STROBE SIGNALING, FAN RELAY, BOILER SHUTOFF RELAY, REMOTE DISPLAY

BOILER, RAYPAK XTHERM #1505A, 1500 MBH NATURAL GAS INPUT, 1440 MBH OUTPUT, ASME STAMPED, 7:1 TURNDOWN, BOILER PUMP, 120V, FLOW SWITCH, PUMP CONTROLLER, CONTROL SYSTEM BACNET INTERFACE, HORIZONTAL VENTING, CONDENSATE NEUTRALIZATION KIT, MULTI BOILER CONTROLS, OA RESET, HIGH LIMIT MANUAL RESET 12 FLA BOILER, 14 FLA PUMP

ONE SHOT FEEDER, WINGERT #DB-12HD WITH #3139 VALVE PACKAGE

CALIBRATED BALANCING VALVE, TACO #ACUF SERIES, THREADED CONNECTIONS, 1" - 8-10 GPM, 1¼" - 11-15 GPM, 1½" - 16-25 GPM

EQUALS:
CHILLER: TRANE, CARRIER, DAIKIN, JOHNSON CONTROLS
PUMPS: TACO, ARMSTRONG, BELL AND GOSSETT
COOLING TOWER: EVAPCO, BAC, MARLEY
BOILER: RAYPAK, LOCHINVAR
HYDRONIC SPECIALTIES: TACO, ARMSTRONG, BELL AND GOSSETT

3 M001 EQUIPMENT SCHEDULE
NO SCALE

CONTRACTOR TO EXPAND OWNERS EXISTING AUTOMATED LOGIC CONTROL SYSTEM TO CONTROL NEW CHILLED AND HOT WATER PLANT. SYSTEM TO BE COMPLETE AND INCLUDE ALL SENSORS, INTERFACES, WIRING, PANELS, ETC.

CHILLED WATER SYSTEM TO INCLUDE CHILLER-TOWER OPTIMIZATION ROUTINES. MONITORING OF CHILLER ENERGY USAGE AND TOWER ENERGY USAGE AT ALL OPERATING CONDITIONS IS REQUIRED. CONTROL SYSTEM SHALL MODULATE TOWER FAN SPEED/CONDENSER WATER TEMPERATURE BASED UPON OPTIMUM COMBINATION AT SPECIFIC WET BULB TEMPERATURES AND CHILLER LOADING. AT FIVE MINUTE INTERVALS, CHILLER LOADING AND WET BULB TEMPERATURE SHALL BE SCANNED AND OPTIMUM CONDENSER WATER SETPOINT RECALCULATED. COOLING TOWER FAN SPEED SHALL MODULATE TO MAINTAIN OPTIMUM CONDENSER WATER SETPOINT.

CHILLER SYSTEMS CONSIST OF CHILLER, COOLING TOWER, CONDENSER PUMP, AND PRIMARY PUMP. CHILLER SYSTEM SHALL BE ENERGIZED CONTINUOUSLY. SYSTEM SHALL LEAD-LAG OPERATION UNTIL LOADING EXCEEDS 60%. AT 60% CAPACITY, SECOND SYSTEM SHALL BE ENERGIZED AND BOTH SYSTEMS SHALL MODULATE TO 30% CAPACITY. SYSTEMS SHALL OPERATE IN PARALLEL UNTIL LOADING FOR SYSTEMS DROPS TO 25% PER SYSTEM. AT THIS POINT, LAG CHILLER TO DEENERGIZE AND SINGLE CHILLER TO OPERATE TO MAINTAIN BUILDING LOAD.

PRIMARY PUMPS TO BE ENERGIZED UPON CHILLER ACTIVATION. PRIMARY CHILLED WATER PUMPS SHALL ALTERNATE OPERATION. FLOW SWITCH AT CHILLER TO VERIFY FLOW. IF FLOW IS NOT RECOGNIZED AFTER START, INITIAL PUMP TO BE DEENERGIZED AND SECOND PUMP SHALL BE ENERGIZED. FAILURE ALARM TO BE SENT TO OWNER NOTIFICATION SYSTEM.

SECONDARY PUMPS TO BE ENERGIZED UPON CALL FOR COOLING OR HEATING IN RESPECTIVE ZONE. SECONDARY PUMPS SHALL ALTERNATE OPERATION. DIFFERENTIAL PRESSURE SWITCH IN LOOP TO VERIFY FLOW. IF FLOW IS NOT RECOGNIZED AFTER START, INITIAL PUMP TO BE DEENERGIZED AND SECOND PUMP SHALL BE ENERGIZED. FAILURE ALARM TO BE SENT TO OWNER NOTIFICATION SYSTEM. SECONDARY PUMPS SHALL BE CONTROLLED BY VARIABLE SPEED DRIVES AND SHALL MODULATE TO MAINTAIN DIFFERENTIAL PRESSURE AT PRESSURE SWITCH(ES).

CONDENSER PUMP TO BE ENERGIZED UPON ACTIVATION OF CHILLED WATER SYSTEM. FLOW TO BE MONITORED AT CHILLER FLOW SWITCH. FAILURE TO PROVE FLOW SHALL DEENERGIZE CONDENSER PUMP AND CHILLED WATER SYSTEM. SECOND CHILLED WATER SYSTEM TO BE ENERGIZED AND OWNER NOTIFIED OF FAILURE.

BAS TO MONITOR REFRIGERANT MONITOR ALARM CONTACTS

BOILER TO BE ENERGIZED WHEN OUTDOOR TEMPERATURE IS BELOW 60F. RESET TEMPERATURE FROM 100F TO 180F BASED ON OUTDOOR TEMPERATURE BY 10F WITH EACH 5F DROP IN OUTDOOR TEMP. BOILER PUMPS TO BE CONTROLLED BY BOILERS

7 M001 CONTROL SYSTEM
NO SCALE

- CONTRACTOR TO VISIT SITE PRIOR TO BID AND BE FAMILIAR WITH ALL EXISTING CONDITIONS.
- HOT WATER SYSTEM CONSISTING OF BOILERS, PUMPS, PIPING, ETC. TO BE BID AS ALTERNATE.
- CHILLERS AND BOILERS TO BE INSTALLED ON 4" HIGH HOUSEKEEPING PADS.

1 M001 GENERAL NOTES
NO SCALE

BUILDING TO REMAIN FULLY OPERATIONAL THROUGH ALL PHASES OF CONSTRUCTION, A THREE DAY WEEKEND, TO BE DETERMINED, WILL BE UTILIZED FOR CHANGEOVER FROM EXISTING CHILLED WATER SYSTEM TO NEW CHILLED WATER SYSTEM. COORDINATE ANY INTERRUPTION OF SERVICE WITH OWNER.

1. REMOVE EXISTING ICE STORAGE TANKS AND ABANDONED PIPING WITHING TANK ROOM.

2. INSTALL ALL PUMPS, PIPING, CHILLERS, ELECTRICAL, CONTROLS, ETC. UP TO TIE IN POINTS. INSULATE PIPING AND COMPLETE ALL MECHANICAL ROOM WORK. FLUSH PIPING AND TREAT WATER.

3. REMOVE EXISTING 80 TON CHILLER AND INSTALL COOLING TOWERS AND TOWER PUMPS.

4. TEST CHILLED WATER SYSTEMS, PUMPS, CHILLERS,, TOWERS, ETC..

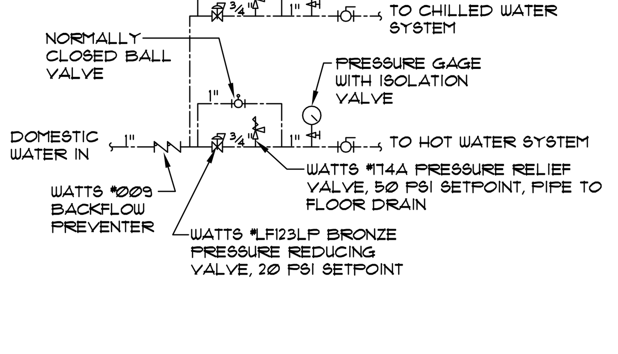
5. AT SCHEDULED SHUTDOWN TIME, TIE IN NEW SECONDARY BRANCHES TO EXISTING BUILDING PIPING, TEST OPERATION AND TREAT WATER AGAIN. SYSTEM TO OPERATE ON NEW EQUIPMENT.

6. REMOVE EXISTING 110 TON AIR COOLED CHILLER, 10 TON AIR COOLED CHILLER, AND ALL ABANDONED EQUIPMENT, PIPING, ELECTRICAL, CONTROLS, ETC. IN PUMP ROOM AND IN PARKING AREA..

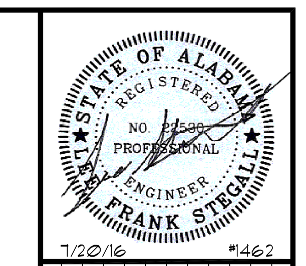
7. EXISTING CHILLERS, PUMPS, TANKS, VALVES, ETC. TO REMAIN PROPERTY OF OWNER AND TO BE STORED AS DIRECTED BY OWNER OR DISPOSED OF IF DIRECTED BY OWNER. CAP CHILLER INLET AND OUTLET PIPING, PUMP INLET AND OUTLETS, ETC. AS REQUIRED FOR PROTECTION OF EQUIPMENT.

8. IN WARM WEATHER REMOVE BOILER SYSTEM AND COMPLETE NEW BOILER INSTALLATION

2 M001 CONSTRUCTION SEQUENCE
NO SCALE



4 M001 SYSTEM FILL DETAIL
NOT TO SCALE



7/20/16 #1462

REVISIONS: NO. | DATE | DESCRIPTION

TUSCALOOSA CITY HALL AND ANNEX
CHILLED WATER CENTRAL PLANT UPGRADE, CITY PROJECT #A16-0801
AT
2201 UNIVERSITY BOULEVARD
TUSCALOOSA, AL 35401

Smith, Stegall
& associates p.c.
Consulting Engineers
2110 8th Street
Tuscaloosa, Alabama 35401
Phone/Fax 205 345 4402

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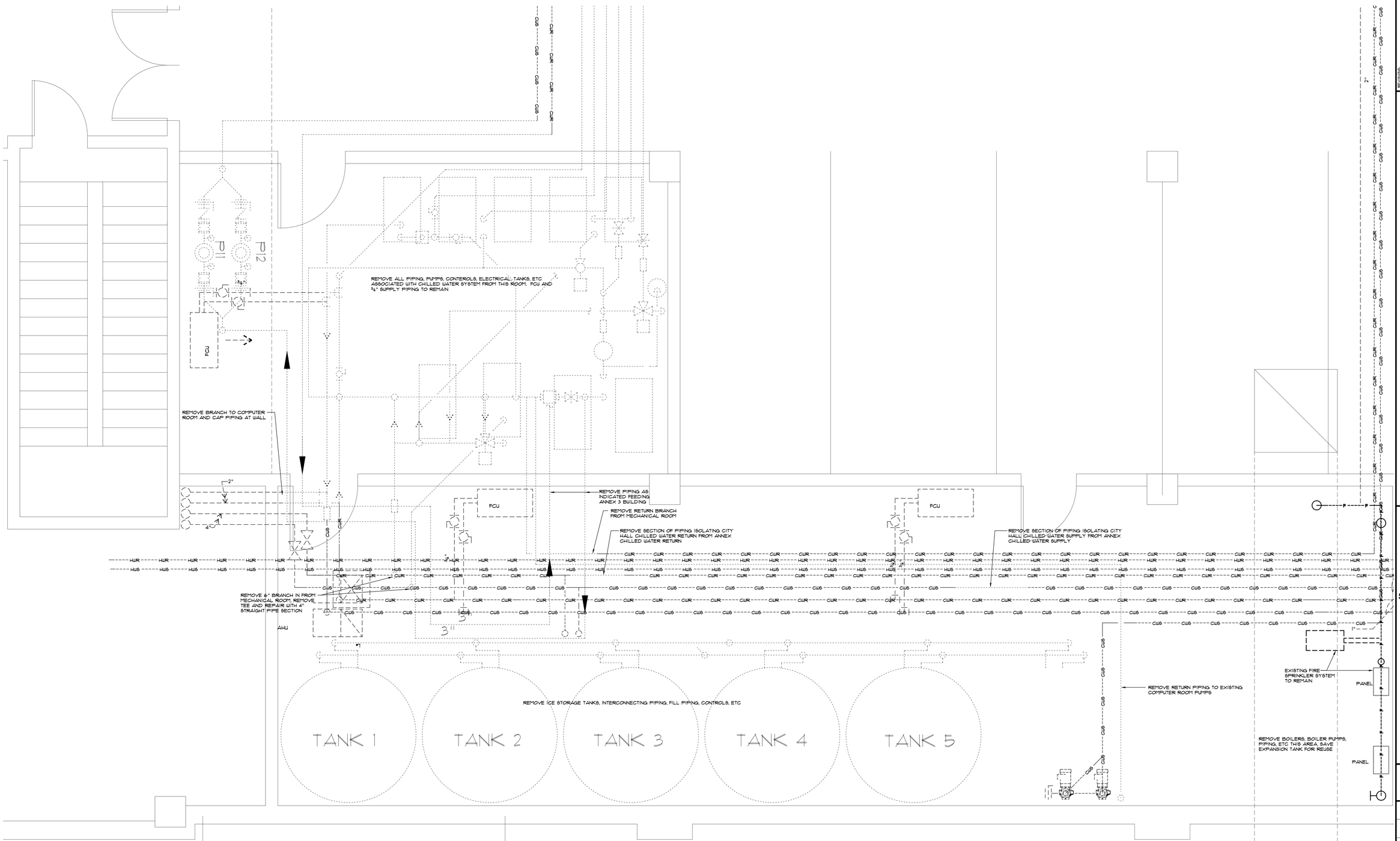
HVAC DETAILS AND SCHEDULES

M001
SHEET 1 OF 8



1 / M002 MECHANICAL ROOM LARGE SCALE DEMOLITION PLAN

1/2"=1'-0"

STATE OF ALABAMA REGISTERED PROFESSIONAL ENGINEER LEE FRANK STEGALL NO. 14462

7/20/16 #1462

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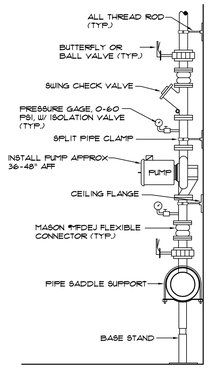
MECHANICAL ROOM DEMOLITION PLAN

M002



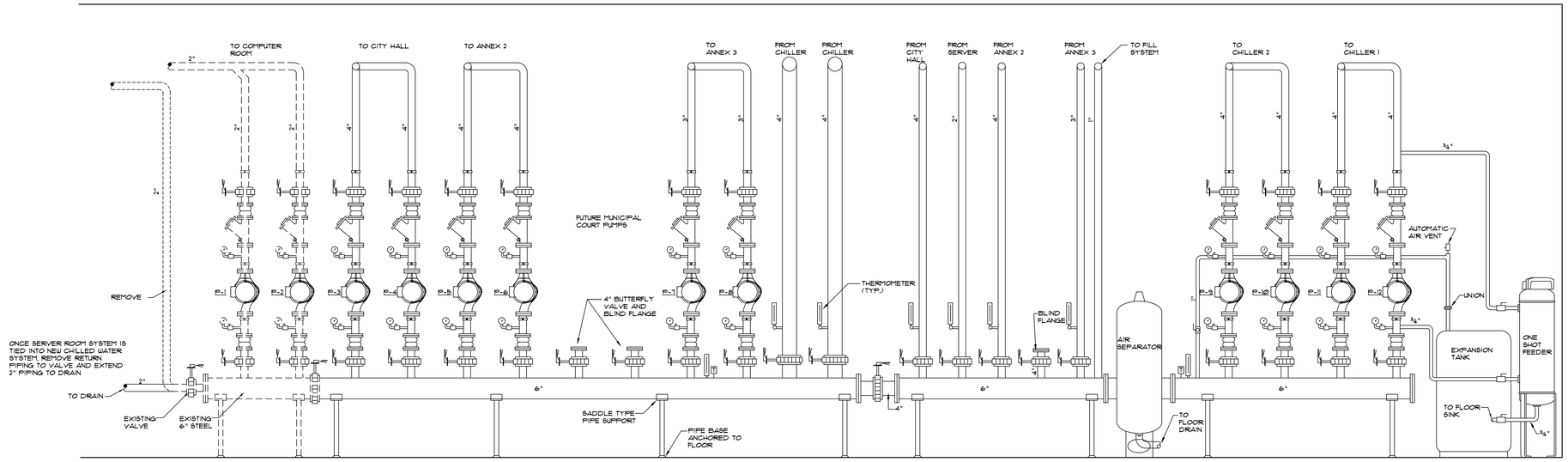
4 M003 PUMP DETAIL

NOT TO SCALE

① REMOVE AUTOMATIC FLOW CONTROL VALVE FROM HOT AND CHILLED WATER. INSTALL CALIBRATED BALANCING VALVE AND BALANCE AS INDICATED

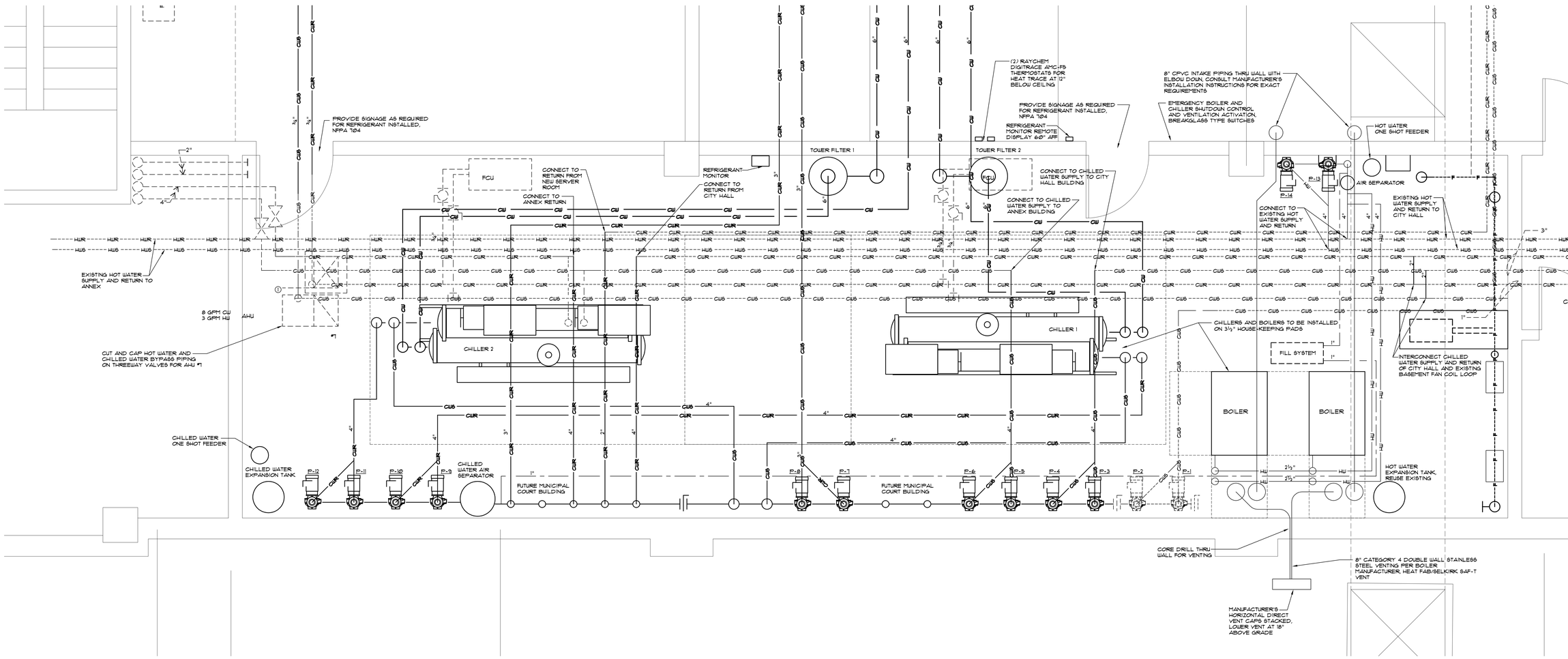
2 M003 DRAWING NOTE

NO SCALE



3 M003 CHILLED WATER PUMP MANIFOLD ELEVATION

NOT TO SCALE



1 M003 MECHANICAL ROOM LARGE SCALE PLAN

1/2"=1'-0"

STATE OF ALABAMA REGISTERED PROFESSIONAL ENGINEER FRANK STEGALL NO.

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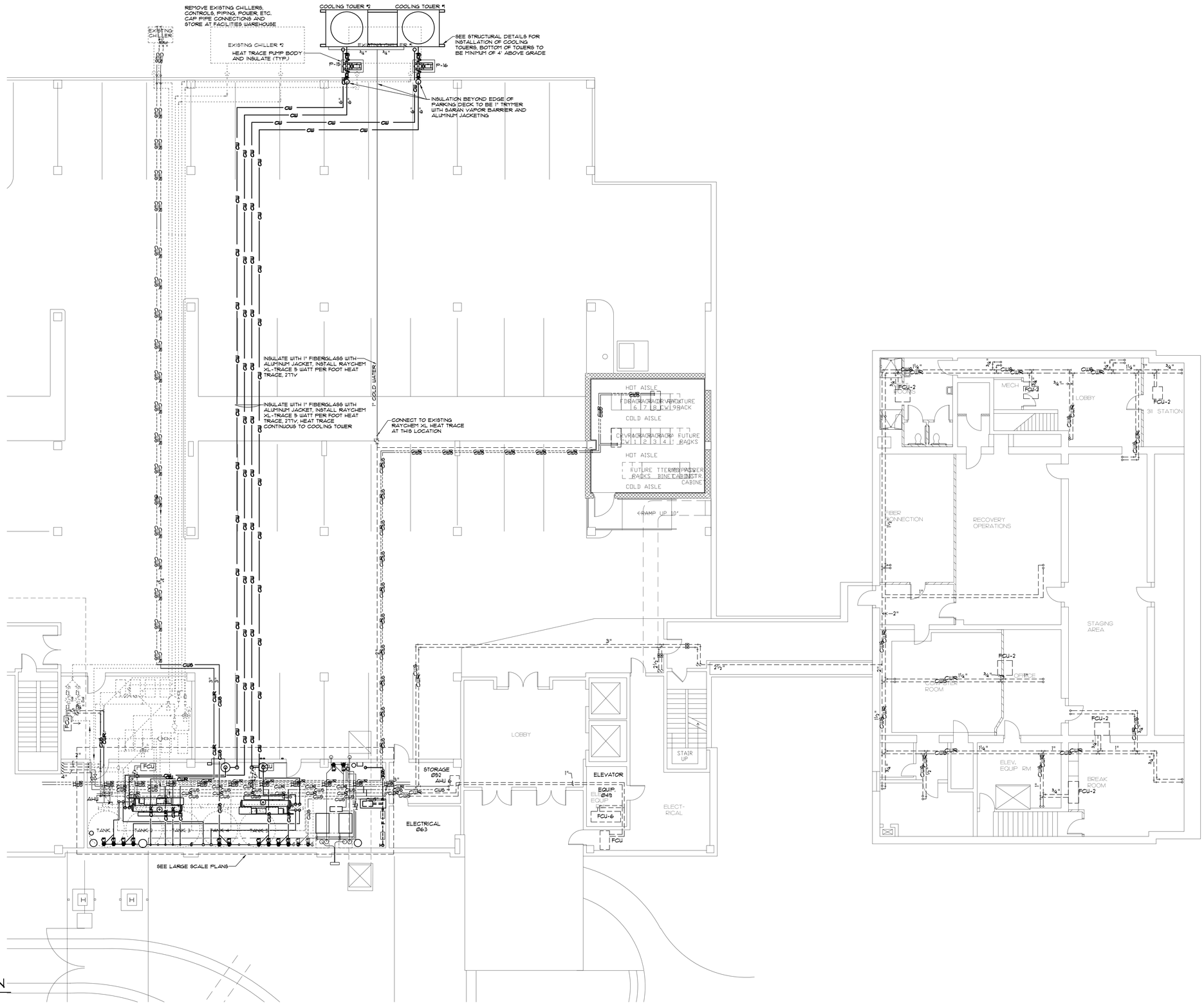
MECHANICAL ROOM LARGE SCALE PLAN

M003

SHEET 3 OF 8



1 M101 GROUND FLOOR HVAC PLAN
1/8"=1'-0"

STATE OF ALABAMA REGISTERED PROFESSIONAL ENGINEER FRANK STEGALL NO.
7/20/16 #462

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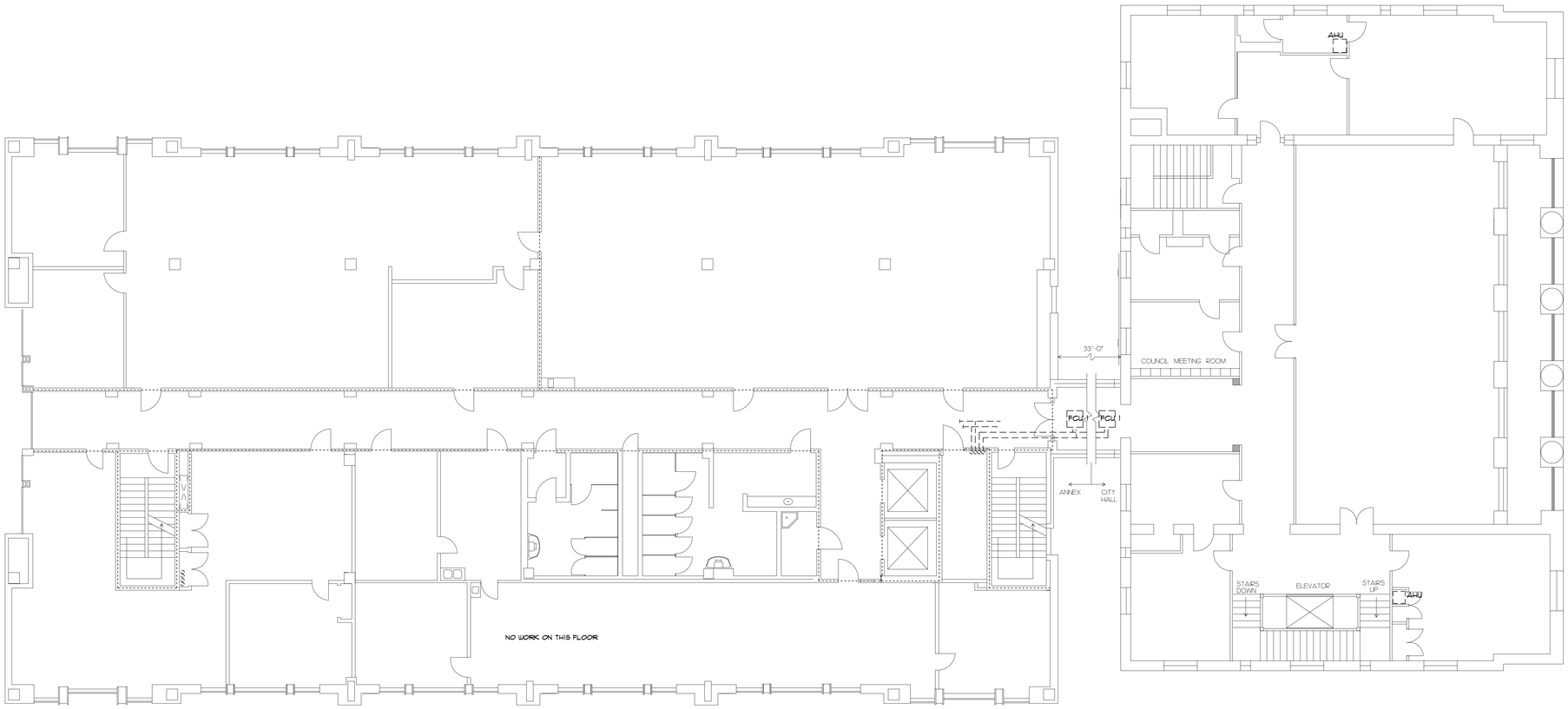
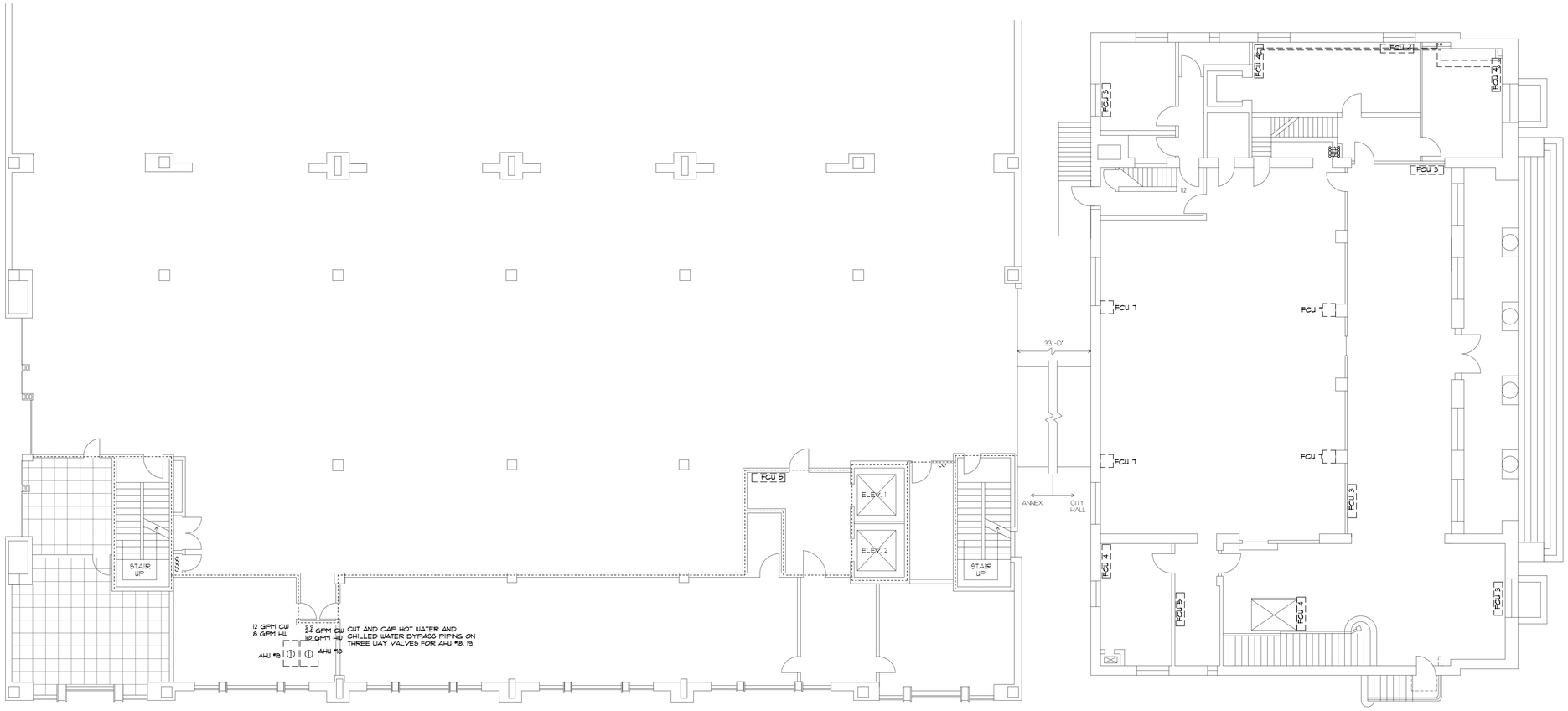
GROUND FLOOR HVAC PLAN

M101



3 M102 SECOND FLOOR HVAC PLAN

1/8"=1'-0"



① REMOVE AUTOMATIC FLOW CONTROL VALVE FROM HOT AND CHILLED WATER. INSTALL CALIBRATED BALANCING VALVE AND BALANCE AS INDICATED

2 M102 DRAWING NOTE

NO SCALE

1 M102 FIRST FLOOR HVAC PLAN

1/8"=1'-0"

STATE OF ALABAMA REGISTERED NO. PROFESSIONAL ENGINEER FRANK STEGALL

7/20/16 #462

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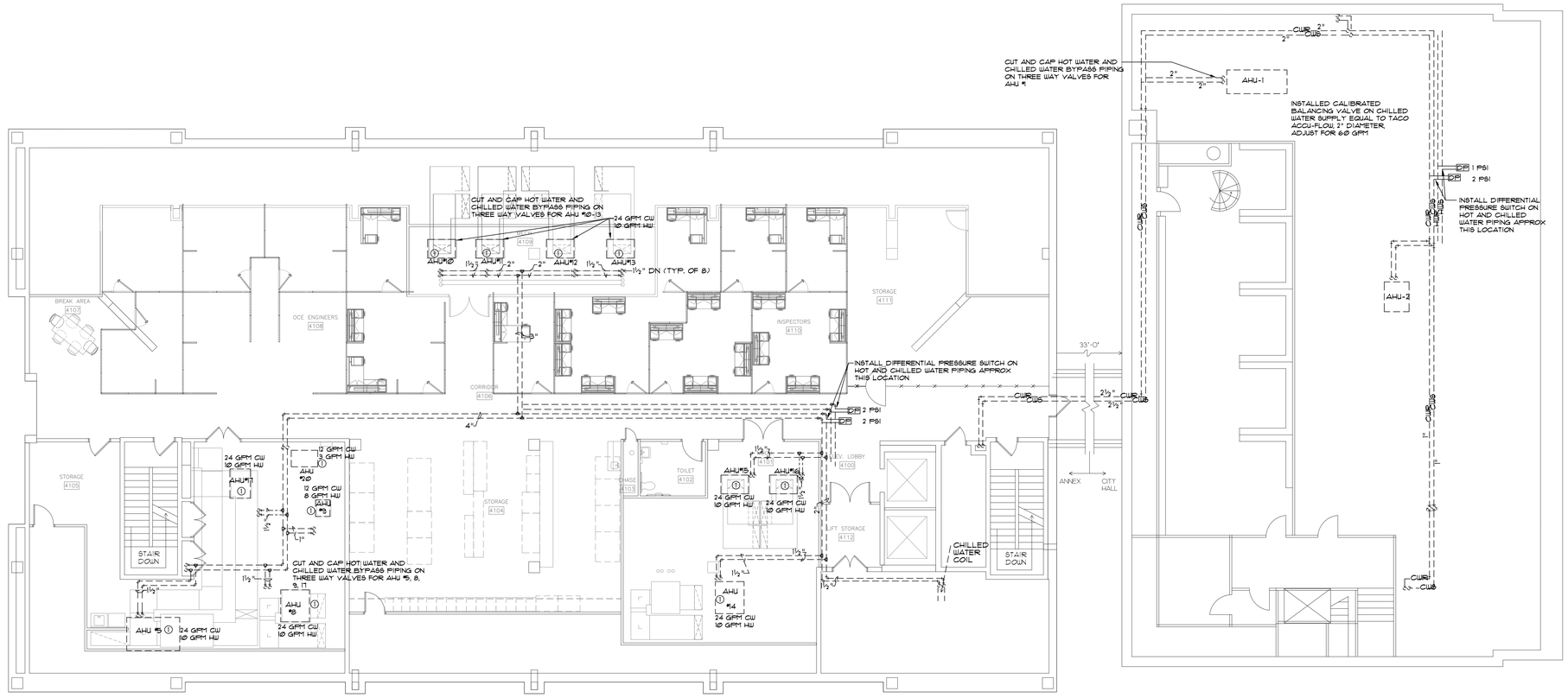
FIRST AND SECOND FLOOR HVAC PLANS

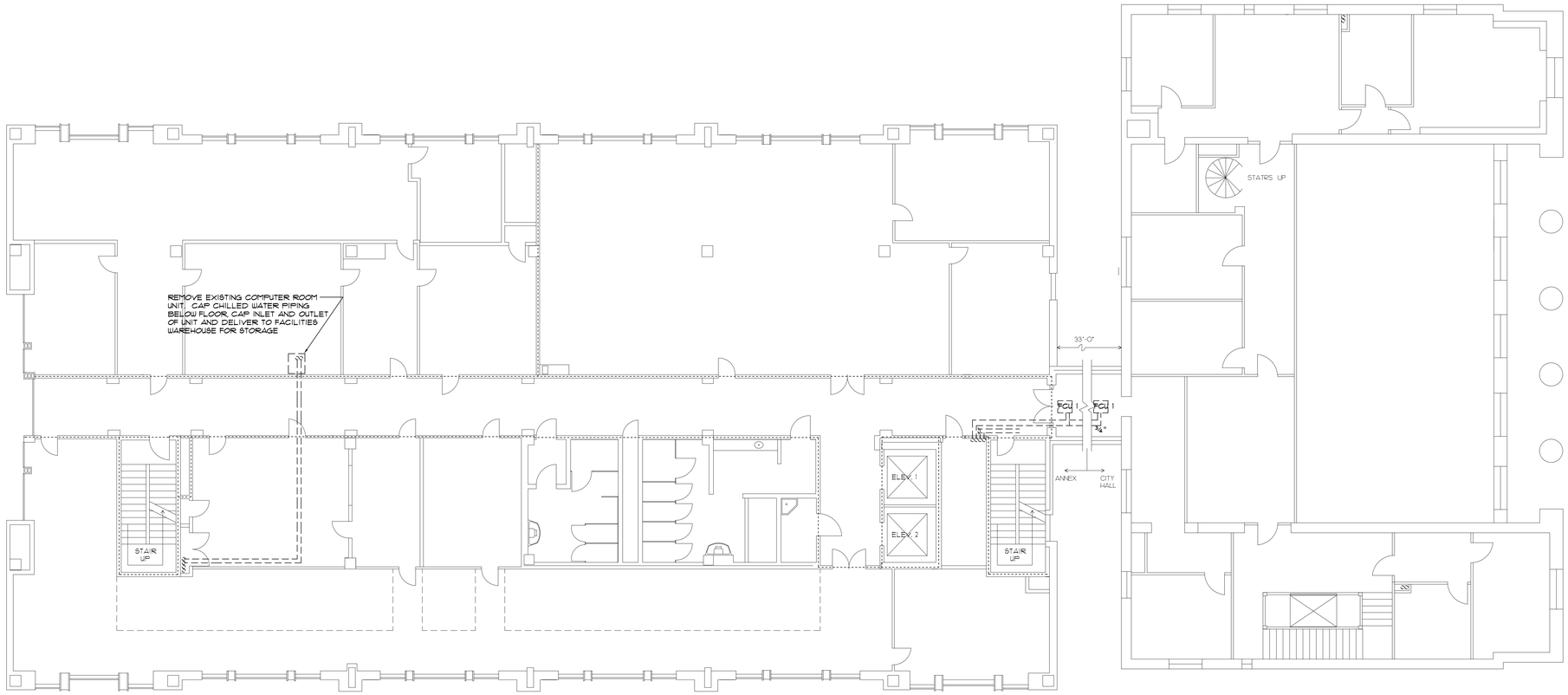
M102

① REMOVE AUTOMATIC FLOW CONTROL VALVE FROM HOT AND CHILLED WATER, INSTALL CALIBRATED BALANCING VALVE AND BALANCE AS INDICATED

3 / M103 DRAWING NOTE
NO SCALE



2 / M103 FOURTH FLOOR HVAC PLAN
1/8"=1'-0"



1 / M103 THIRD FLOOR HVAC PLAN
1/8"=1'-0"

STATE OF ALABAMA REGISTERED PROFESSIONAL ENGINEER LARRY FRANK STEGALL
7/20/16 #1462

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THIRD AND FOURTH FLOOR HVAC PLANS

M103